



# **MTR2000™**

## **Base Station, Repeater and Receiver**

**For Analog Conventional,  
and Trunking Systems  
132 - 174 MHz**

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**Depot Manual**

**68P81096E40-F**



**MTR2000<sup>TM</sup>**  
**Base Station, Repeater**  
**and Receiver**  
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- b. the product has been subject to misuse, accident, neglect or damage;
- c. unauthorized alterations or repairs have been made, or unapproved parts used in the equipment.

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In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

## FCC INTERFERENCE WARNING

The FCC requires that manuals pertaining to Class A and Class B computing devices must contain warnings about possible interference with local residential radio and TV reception. This warning reads as follows:

NOTE: The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial or residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with its instruction manual, may cause harmful interference to radio communication.

## ELECTROMAGNETIC COMPATIBILITY (U.S.)

This product conforms with the protection requirements of Council Directive 89/336/EEC of 3rd May 1989 (EMC) on the approximation of the laws of the Member States relating to electromagnetic compatibility.

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## ENVIRONMENTAL INFORMATION

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### Material Content

The material content of the MTR2000 is 16% of the product it replaces.

The following table provides a rough estimate of the material content of the station. The actual percentages vary in relation to the station configuration. The power supply is not included in the percentage of weights since the end-of-life value is dependent on the model of supply used in the station.

Most of the Material categories are self explanatory. Copper bearing materials:

- include any material that contains copper.
- primarily consist of circuit boards.
- exclude cables (separate Material category).

| Material       | % by weight |
|----------------|-------------|
| Aluminum       | 92%         |
| Steel          | 2%          |
| Copper Bearing | 4%          |
| Cable          | 1%          |
| Polycarbonate  | 1%          |

Beryllium Oxide has been used in the power amplifier. Beryllium Oxide should not be subjected to any process which will generate dust.

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### Features

Over 92% of the station is made of aluminum, one of the most recycled materials commonly available today. In addition, the aluminum used in the station consists of 90-95% recycled content.

Plastic use has been minimized since the market for recycled engineering plastics is limited. The plastic which has been used for the front panel is a relatively clean and pure resin.

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## Disposal of your Electronic and Electric Equipment

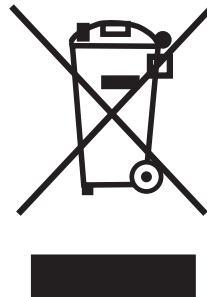
Please do not dispose of Electronic and Electric Equipment or Electronic and Electric Accessories with your household waste. In some countries or regions, collection systems have been set up to handle waste of electrical and electronic equipment.

In European Union countries, please contact your local equipment supplier representative or service center for information about the waste collection system in your country.

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## Disposal Guideline

The following symbol on a Motorola product indicates that the product should not be disposed of with household waste.





**MTR2000™**  
**Base Station, Repeater**  
**and Receiver**  
**For Analog Conventional,**  
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**132 - 174 MHz**

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### STATION OVERVIEW

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**RECEIVER MODULES**

**TRD6431C, TRD6411C**

**TRD6431C Receiver Module (132 to 174 MHz)**

**TRD6411C Receiver Module without  
internal preselector(132 to 174 MHz) 68P81094E11**

**TRANSMITTER MODULES**

**TTD6301C**

**TTD6301C Exciter Module (132 to 174 MHz) 68P81094E12**

**TTD1921A, TTD1781A**

**TTD1921A 30 W Power Amplifier Module (132 to 174 MHz)**

**TTD1781A 40 W Power Amplifier Module (132 to 174 MHz) 68P81094E14**

**CLD1301A, CLD1300A**

**CLD1301A 100 W Power Amplifier Module (132 to 154 MHz)**

**CLD1300A 100 W Power Amplifier Module (150 to 174 MHz) 68P81094E13**

**STATION CONTROL MODULE**

**TCN6273N**

**TCN6273N Station Control Module 68P81094E31**

**WIRELINE INTERFACE BOARDS****TTN5066B****TTN5066B 4-Wire Euro Wireline Interface Board****68P81094E27****TTN5067B****TTN5067B 4-Wire Wireline Interface Board****68P81094E28****TTN5068A****TTN5068A 8-Wire Wireline Interface Board****68P81094E29****AUXILIARY I/O BOARD****CLN6698B****CLN6698B Auxiliary I/O Board****68P81094E74****BACKPLANE****TTN5062B****TTN5062B Backplane Interconnect Board****68P81094E32**





**This graphic symbol appears on the station front panel (and other station surfaces) as a reminder that the station can become extremely hot during normal station operation. Turn off all power to the station and wait until it is sufficiently cool before touching the station.**



# INTRODUCTION

## 1

### INTENDED USE OF THIS MANUAL

This manual is intended to be used by experienced Motorola service technicians to aid in the troubleshooting and repair of Motorola MTR2000 Field Replaceable Units (FRUs) returned from the field for repair. Information is provided to allow the technician to troubleshoot and make repairs to the component level.

## 2

## CONTENTS OF MANUAL

## Product Covered in this Manual

This manual contains detailed servicing information for the MTR2000 VHF station.

For functional information such as functional theory and system information, refer to the corresponding Instruction/Field Service manual;

MTR2000 UHF Instruction/Field Service manual, 68P81096E30



The Instruction/Field Service manual identifies station modules according to the Field Replacement Unit (FRU) kit numbers.

The Depot manual identifies station modules according to the module kit numbers.

A cross-reference of FRU and module kit numbers is provided in Table 1. The modules are listed in alphanumeric order.

**Table 1. Module vs. FRU Kit Numbers**

| Module Kit # | FRU Kit # | Module Description   |
|--------------|-----------|--|
| CLN6698      | CLN1216   | Auxiliary I/O Board  |
| TCN6273      | CLN1465   | Station Control Module   |
| TRD6411      | CLN1212   | Receiver Module (132 to 174 MHz)<br>- without varactor preselector |
| TRD6431      | CLN1211   | Receiver Module (132 to 174 MHz)<br>- with varactor preselector    |
| TTD1781      | CLN1226   | Power Amplifier (40 W, 132 to 174 MHz)                             |
| TTD1791      | CLN1224   | Power Amplifier (100 W, 132 to 154 MHz)                            |
| TTD1792      | CLN1225   | Power Amplifier (100 W, 150 to 174 MHz)                            |
| TTD1921      | CLN1227   | Power Amplifier (30 W, 132 to 174 MHz)                             |
| TTD6301      | CLN1233   | Exciter Module (132 to 174 MHz)                                    |
| TTN5062      | CLN1202   | Station Backplane Board  |
| TTN5066      | CLN1204   | 4-Wire Euro Wireline Interface Module                              |
| TTN5067      | CLN1203   | 4-Wire Wireline Interface Module                                   |
| TTN5068      | CLN1205   | 8-Wire Wireline Interface Module                                   |

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## Station Overview

For an overall view of the station, the following information is provided:

- Station Functional Block Diagram (labelled Functional B D)
- Exploded View
- Station Top-level Parts List

Each callout number on the exploded view corresponds to a Reference Number in the Parts List.

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## Module Service Details

Service information for each module and board in the MTR2000 is provided in a package of drawings. Each package is identified by a unique part number, and comprises a:

- Functional Block Diagram (labelled Functional B D)
- Set Of Schematics (labelled Schematics)
- Board Layout Drawing (labelled Board Detail)
- Parts List (labelled Parts List)

The exception to the above structure is the Station Backplane Module (TTN5062), which does not contain a Functional Block Diagram.

Most packages support more than one model of module or board.

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HOW TO USE THIS MANUAL

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Finding Information

Tabs                      Tabs (color keyed to the frequency band color) provide quick and easy access to functional groupings of circuitry; for example, **Receiver Modules**, **Transmitter Modules**, etc.

White tabs identify each drawing package and are labeled with the appropriate model number(s).

Table of Contents      The Table of Contents provides a listing of the module/board packages according to the tab reference.

To further aid in locating information within this manual, Table 2 provides a cross reference between the module/board model number and the corresponding tab labels. The modules are listed in alphanumeric order.

**For Example**  
to find the package for model TTN5067, Wireline Interface Board, look up TTN5067 in Table 2. The package for this model is found behind the **Wireline Boards** color tab, and then behind the **TTN5066, TTN5067** white tab. The indicated manual part number is at the bottom of each page of the package and the model number is indicated in the header of the package.

Page Headers              The relevant module or board model number (e.g., TTN5067) is shown on the header of each sheet.

Table 2. Model vs. Tab Labels

| <b>Model Number</b> | <b>Module / Board Name</b>                      | <b>Color Tab Label</b>     | <b>White Tab Label</b>  | <b>Manual Part #</b> |
|---------------------|---|----------------------------|-------------------------|----------------------|
| CLN6698             | Auxiliary I/O Board                             | <b>Auxiliary I/O Board</b> | <b>CLN6698</b>          | 68P81094E74          |
| TCN6273             | Station Control Module                          | <b>Controller Module</b>   | <b>TCN6273</b>          | 68P81094E31          |
| TRD6411             | Receiver module with built-in preselector       | <b>Receiver Modules</b>    | <b>TRD6411, TRD6431</b> | 68P81094E11          |
| TRD6431             | Receiver module without built-in preselector    | <b>Receiver Modules</b>    | <b>TRD6411, TRD6431</b> | 68P81094E11          |
| TTD1781             | 40 W Power Amplifier Module                     | <b>Transmitter Modules</b> | <b>TTD1921, TTD1781</b> | 68P81094E14          |
| TTD1791             | 100 W Power Amplifier Module, 132-154 MHz       | <b>Transmitter Modules</b> | <b>TTD1791, TTD1792</b> | 68P81094E13          |
| TTD1792             | 100 W Power Amplifier Module, 150-174 MHz       | <b>Transmitter Modules</b> | <b>TTD1791, TTD1792</b> | 68P81094E13          |
| TTD1921             | 30 W Power Amplifier Module                     | <b>Transmitter Modules</b> | <b>TTD1921, TTD1781</b> | 68P81094E14          |
| TTD6301             | Exciter Module                                  | <b>Transmitter Modules</b> | <b>TTD6301</b>          | 68P81094E12          |
| TTN5062             | Backplane Board                                 | <b>Backplane Board</b>     | <b>TTN5062</b>          | 68P81094E32          |
| TTN5066             | Euro Wireline Interface Board                   | <b>Wireline Boards</b>     | <b>TTN5066</b>          | 68P81094E27          |
| TTN5067             | 4-Wire Wireline Interface Board with D-C Remote | <b>Wireline Boards</b>     | <b>TTN5067</b>          | 68P81094E28          |
| TTN5068             | 8-Wire Wireline Interface Board                 | <b>Wireline Boards</b>     | <b>TTN5068</b>          | 68P81094E29          |

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## Reading Drawings and Parts Lists

Where a package covers more than one model, a description of the differences between the models is provided at the front of the package.

The block diagrams, schematics, and board layout drawings are provided on fold-out sheets.

### Schematics

The schematics are presented for left-to-right signal flow (where practical) and contain theory notes, waveforms, dc voltages, RF levels, IC data tables, and other pertinent information to aid the technician in troubleshooting and servicing the station to the component level. Any components on the schematic which are marked **IGNORE** are not placed on the printed circuit board.

Each set of schematics begins with a block diagram followed by detailed schematics. The block diagram contains interconnected blocks. Each block represents a functional section of circuitry for which a detailed schematic follows.

Symbols are used to highlight information on the schematics as follows:



Service Notes

This symbol highlights a point at which a voltage level is provided.

The service note symbol indicates that a service note is available for the associated section of circuitry. The letter within the circle uniquely identifies the service note. The service notes are provided as a table, in close proximity to the associated schematic.

Service notes, where applicable, provide:

- a brief description of the circuitry operation.
- current level,
- voltage level,
- signal level, and
- pinout tables for custom ICs.

### Board Layouts

Each drawing shows the location and reference designation for all electrical components. Where applicable, connectors, cables, and other information are shown as troubleshooting aids.

### Parts Lists

A complete list of all parts is provided with the parts ordered according to the schematic reference number.

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## HOW TO ORDER MODULES, PARTS, AND SERVICE AIDS

For complete information on ordering FRU replacements, models, kits, and parts, contact the appropriate facility from those listed below.

|   | Address  | Phone No.        | FAX No.          |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
|---|--|------------------|------------------|----------|-------------|--------|--------------|----------|--------------|------------|-------------|----------|-------------|--------------|-------------|-----------|----------------|---------|-------------|---------|----------------|-----------|----------------|----------|----------------|--------|--------------|---------|--------------------|---------|--------------|-----|----------------|--------------|----------------|----------|----------------|----------|-----------|
| <b>United States</b>  | Motorola Inc.<br>Americas Parts Division<br>1313 E. Algonquin Rd.<br>Schaumburg IL,<br>60196, USA                | (800) 422-4210   | (847) 538-8198   |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>Canada</b>   |  |                  | (847) 538-8193   |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>International</b>  |  | (847) 538-8023   | (847) 576-3023   |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>Mexico</b>   | Motorola de Mexico<br>Huatabampo No. 50<br>APDO Postal 71064<br>Mexico DF 06700                                  | (525) 584-4560   | (525) 584-6843   |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>Asia</b>   | Motorola Singapore Parts<br>Centre<br>1302 Lor 1 Toa Payoh Siong<br>Hoe Ind Bldg.<br>#01-03/04<br>Singapore 1231 | (65) 353-0311    | (65) 353-9152    |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>Australia &amp;<br/>New Zealand</b>  | Motorola Australia Ltd.<br>666 Wellington Rd.<br>Victoria 3170<br>Melbourne<br>Australia                         | (61) 3 566-7766  | (61) 3 566-7910  |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>Japan</b>  | Nippon Motorola Ltd.<br>3-20-1 Ninomi Azabu<br>Minato-Ku Tokyo 106<br>Japan                                      | (81) 3 3440 3311 | (81) 3 3440 3505 |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>Europe,<br/>Mideast &amp;<br/>Africa</b>   | Motorola GmBH<br>Heinrich - Hertz Strasse 1<br>D-65232 Taunusstein 4<br>Germany                                  | 0049-6128-702164 | 0049-6128-704903 |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| <b>OR</b><br>Local phone numbers are available for the following European countries: <table> <tr> <td>Austria:</td><td>06 60 75 41</td><td>Italy:</td><td>16 78 77 387</td></tr> <tr> <td>Belgium:</td><td>08 00 72 471</td><td>Luxemburg:</td><td>08 00 23 27</td></tr> <tr> <td>Denmark:</td><td>80 01 55 72</td><td>Netherlands:</td><td>60 22 45 13</td></tr> <tr> <td>Finnland:</td><td>08 00 11 49 10</td><td>Norway:</td><td>80 01 11 15</td></tr> <tr> <td>France:</td><td>08 00 90 30 90</td><td>Portugal:</td><td>05 05 49 35 70</td></tr> <tr> <td>Germany:</td><td>01 30 18 75 24</td><td>Spain:</td><td>90 09 84 902</td></tr> <tr> <td>Greece:</td><td>00 80 04 91 29 020</td><td>Sweden:</td><td>02 07 94 307</td></tr> <tr> <td>UK:</td><td>08 00 96 90 95</td><td>Switzerland:</td><td>08 00 55 30 82</td></tr> <tr> <td>Ireland:</td><td>18 00 55 50 21</td><td>Iceland:</td><td>80 08 147</td></tr> </table> |  |                  |                  | Austria: | 06 60 75 41 | Italy: | 16 78 77 387 | Belgium: | 08 00 72 471 | Luxemburg: | 08 00 23 27 | Denmark: | 80 01 55 72 | Netherlands: | 60 22 45 13 | Finnland: | 08 00 11 49 10 | Norway: | 80 01 11 15 | France: | 08 00 90 30 90 | Portugal: | 05 05 49 35 70 | Germany: | 01 30 18 75 24 | Spain: | 90 09 84 902 | Greece: | 00 80 04 91 29 020 | Sweden: | 02 07 94 307 | UK: | 08 00 96 90 95 | Switzerland: | 08 00 55 30 82 | Ireland: | 18 00 55 50 21 | Iceland: | 80 08 147 |
| Austria:  | 06 60 75 41  | Italy:           | 16 78 77 387     |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| Belgium:  | 08 00 72 471   | Luxemburg:       | 08 00 23 27      |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| Denmark:  | 80 01 55 72  | Netherlands:     | 60 22 45 13      |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| Finnland:   | 08 00 11 49 10   | Norway:          | 80 01 11 15      |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| France:   | 08 00 90 30 90   | Portugal:        | 05 05 49 35 70   |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| Germany:  | 01 30 18 75 24   | Spain:           | 90 09 84 902     |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| Greece:   | 00 80 04 91 29 020   | Sweden:          | 02 07 94 307     |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| UK:   | 08 00 96 90 95   | Switzerland:     | 08 00 55 30 82   |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |
| Ireland:  | 18 00 55 50 21   | Iceland:         | 80 08 147        |          |             |        |              |          |              |            |             |          |             |              |             |           |                |         |             |         |                |           |                |          |                |        |              |         |                    |         |              |     |                |              |                |          |                |          |           |



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## WHAT SERVICE AIDS ARE RECOMMENDED

## MTR2000-Specific Service Aids

Service aids which specifically support the servicing of the MTR2000 station are listed in Table 3.

Table 3. Service Aids

|                                 | Aid                            | Part Number | Description   |
|---------------------------------|--------------------------------|-------------|---|
|                                 | MTR2000 Radio Service Software | RVN4148     | Used to service and program the station.  |
|                                 | Option Card tool               | 6683334X01  | Used to pull the option boards (such as the Wireline Interface Boards or the Auxiliary Input/Output board) from the backplane.                                  |
|                                 | Fuse, 5A Fast Acting           | 6583049X16  | Used to replace fuse on Backplane.  |
|                                 | Wireline connector tool        | 6600809D00  | Wire extraction tool.   |
|                                 | <b>Cables</b>                  |             |   |
| Service Speaker to Station      | Service Speaker adapter cable  | 0185180U01  | Used to connect the service speaker to the station RJ 45 Service Speaker connector on the Station Control Module.   |
| Backplane to Power Amplifier    | 10-Conductor 0.3m (12in) cable | 3082057V04  | Used to connect the Backplane to the Power Amplifier when station is disassembled.  |
| Backplane to Power Supply       | 8-Wire 0.3m (12in) cable       | 3082728X07  | Used to connect the Backplane to the Power Supply when station is disassembled.   |
| Power Supply to Power Amplifier | 2x3 Wire 0.38m (15in) cable    | 3082728X06  | Used to connect the Power Supply to the Power Amplifier when station is disassembled. This cable is part of the station, but can also be used as a service aid. |

Table 3. Service Aids

|  | <b>Aid</b>                          | <b>Part Number</b> | <b>Description</b>   |
|--|-------------------------------------|--------------------|--|
| Backplane to Control Cluster, or Option Card, or External System | 1 m (39.4in) system/ extender cable | 3083384X01         | Used (when station is disassembled) to connect the Backplane to the Control Cluster, or connect the Backplane to an Option Card, or connect the Backplane to an external system. |
| Computer to RSS Port   | DB9 to RJ45 cable                   | 3082056X02         | Used to connect a computer to the RJ45 RSS port connector on the Station Control Module.   |
| Test Equipment to Station  | RJ45 to BNC cable                   | 3083191X02         | Used to test the Receiver module.  |
| DC Supply to Station   | DC cable                            | 3082009X02         | Used to connect DC power supply to station or DC battery backup to station. This cable is part of the station, but can also be used as a service aid.                            |

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## Generic Service Aids

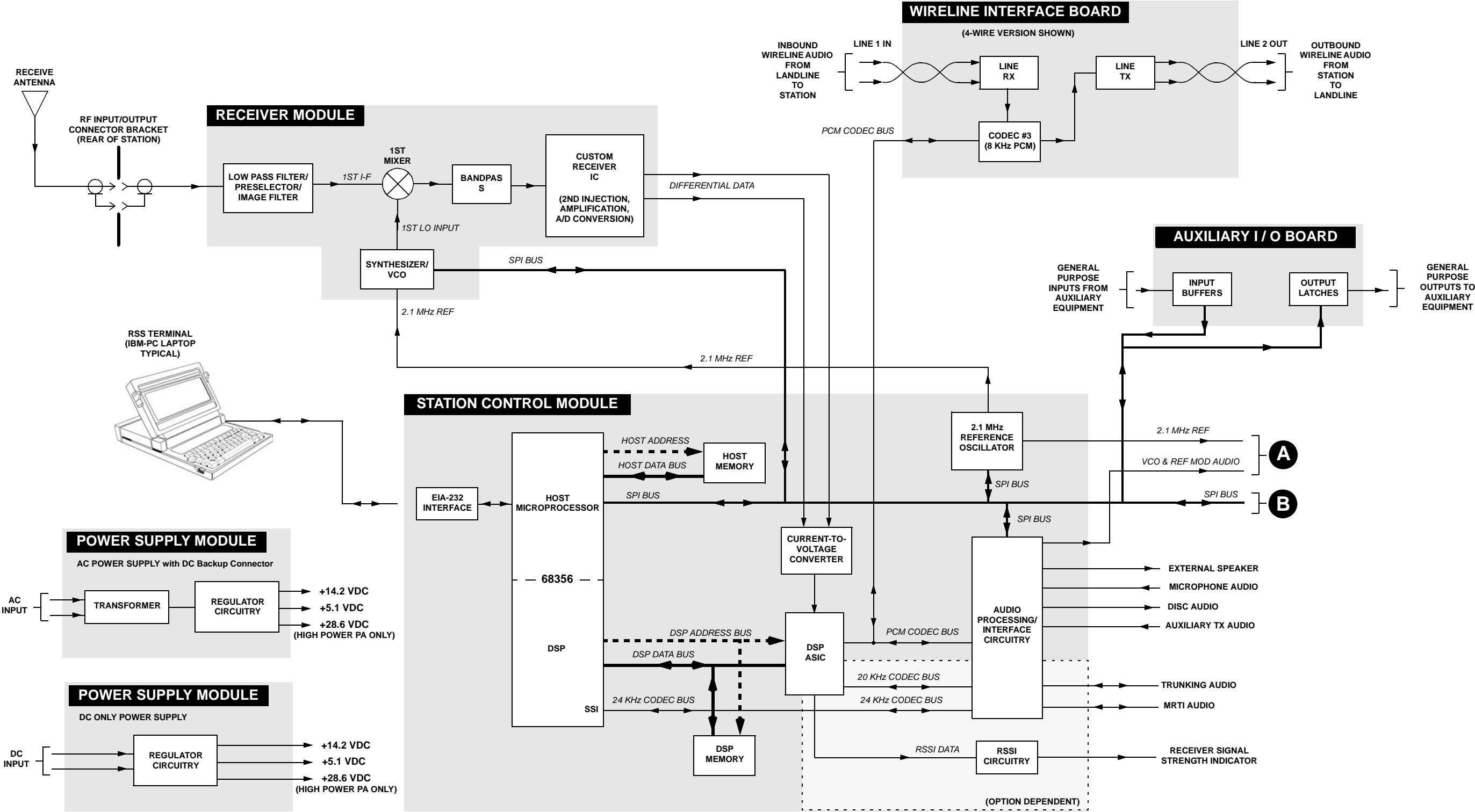
Generic service aids which are recommended for servicing the MTR2000 are as follows:

- Communications Analyzer (e.g., Motorola R2001)
- PC running Microsoft Windows™ 3.1 or Windows™ 95 or Windows™ 98.
- In-Line Wattmeter (Motorola S-1350 or equivalent)
- Dummy Load (50  $\frac{3}{4}$ , station wattage or higher)
- Service microphone with PTT switch and 3 special function switches (GMN6147B or equivalent)
- Service speaker (HSN1000)
- female N-type to female N-type coaxial cable

For tuning preselectors, the following equipment is required:

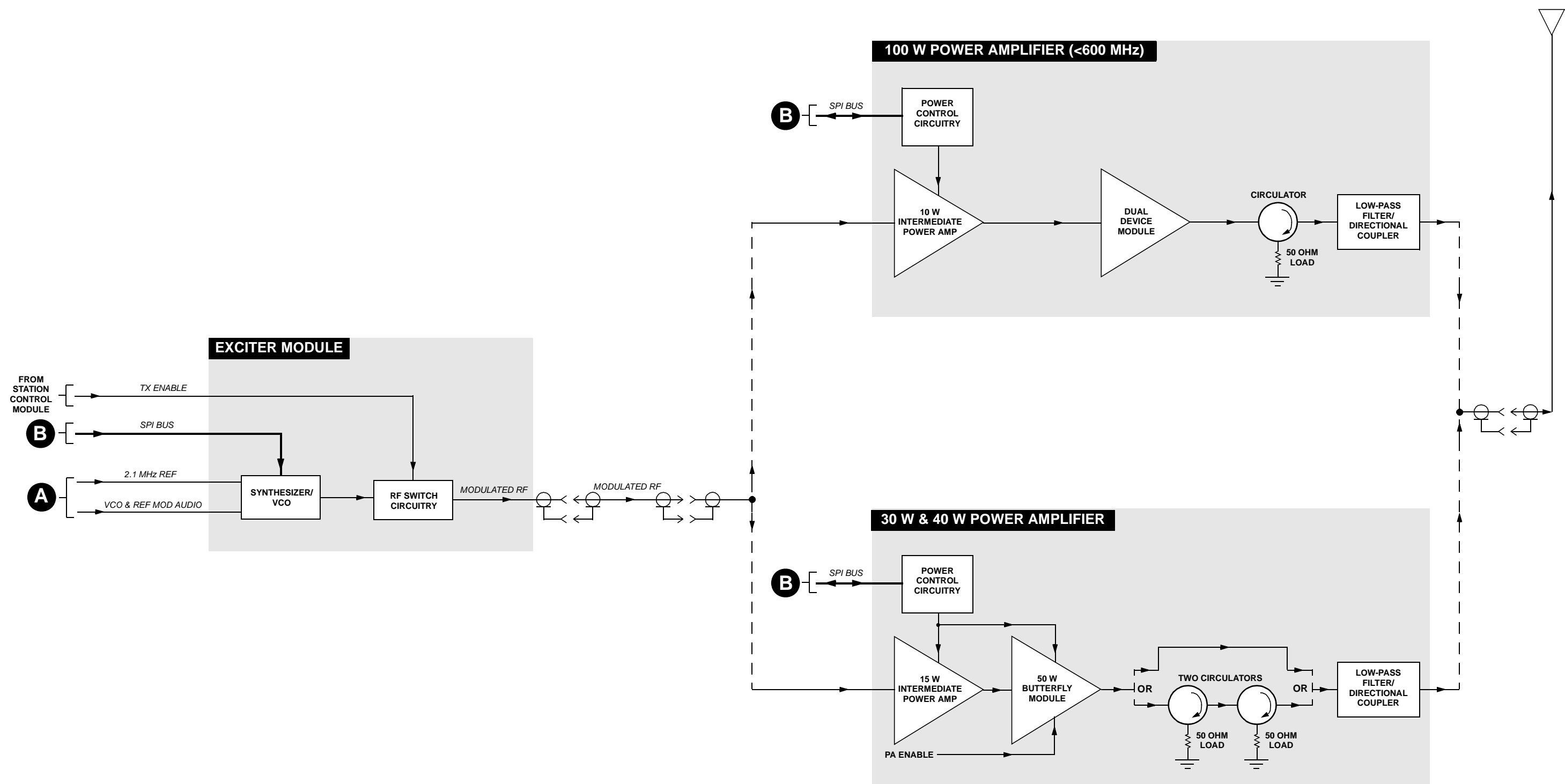
- RF signal generator – Motorola R2600 or R2001 Communications Analyzer (see note below), or HP8656A signal generator (or equivalent)
- Dip/Peak Monitor – HP435B Power Meter (or equivalent) with HP8484A sensitive power head, Boonton Model 92E with BNC input, or R2001/R2600 using the spectrum analyzer function
- Torque driver capable of delivering 1.36Nm (12 in-lb) of torque and 10 mm deep well socket
- Tuning probe – Motorola Part No. 0180763D22, p/o TRN7799

STATION OVERVIEW  
VHF (132 TO 174 MHZ)



MTR2000 STATION FUNCTIONAL BLOCK DIAGRAM (SHEET 1 OF 2)

STATION OVERVIEW  
VHF (132 TO 174 MHZ)



MTR2000 STATION FUNCTIONAL BLOCK DIAGRAM (SHEET 2 OF 2)

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Parts List

VHF STATION OVERVIEW

| REFERENCE NUMBER                     | MOTOROLA PART NO. | DESCRIPTION  |
|--------------------------------------|-------------------|--|
| TGN6153A FRONT PANEL                 |                   |  |
| 1                                    | 6482633X02        | Panel Front  |
| TKN9137A CABLES, STATION             |                   |  |
|                                      | 3012029N08        | BNC Male BNC Male 9                                |
|                                      | 3082057V03        | Cable Ribbon                                       |
| TTN5215A STATON CHASSIS HARDWARE     |                   |  |
|                                      | 0310907A61        | SCR MCH M8X1/25X20 STARPAN STL                     |
|                                      | 0310907C99        | RMCH M4X0.7X18 STRPAN STL (2 used)                 |
|                                      | 0310943J21        | Screw, tapping: TT4 X 0.7 x 10 (6 used)            |
|                                      | 0310943R23        | SCRTPG TT4X0.7X13 STRFLTCHS (12 used)              |
|                                      | 0383498N14        | Screw, tapping: M4 x 0.7 x 18 (8 used)             |
|                                      | 0782635X01        | Bracket Option Card                                |
| 2                                    | 1582625X02        | Housing, Top/bot Casting (2 used)                  |
| 3                                    | 3082728X04        | Cable, 8-WIRE 4"                                   |
|                                      | 4210217A04        | Strap, tie: 0.184 x 7.31" lg (5 used)              |
|                                      | 5485282U01        | Label, Barcode                                     |
| TTN5239A BACKPLANE, HARDWARE HI TIE  |                   |  |
|                                      | 0310943J21        | Screw, tapping: TT4 X 0.7 x 10 (4 used)            |
|                                      | 0312016A03        | SCRTPG TT3X0.5X8 STARPAN (2 used)                  |
| 5                                    | 2682636X07        | Shield, Backplane Hi Tier 22                       |
|                                      | 5485212U02        | Label, Thermal XFR Ribbon                          |
|                                      | 5485212U04        | Label  |
| THN6762B MODULE HOUSING CONTROLLER   |                   |  |
|                                      | 0383498N14        | Screw, tapping: M4 x 0.7 x 18 (6 used)             |
| 7                                    | 1582628X02        | Housing Control Bottom Casting                     |
| 8                                    | 1582629X02        | Housing Control Top Casting                        |
| 9                                    | 3282610Y01        | Gasket RF (44 used)                                |
|                                      | 5485282U01        | Label, Barcode                                     |
| THN6763A MODULE HOUSING RECEIVER     |                   |  |
|                                      | 0383498N14        | Screw, tapping: M4 x 0.7 x 18 (5 used)             |
| 11                                   | 1582630X02        | Housing RX Bottom Casting                          |
| 12                                   | 1582679X02        | Housing RX Top Casting                             |
| 9                                    | 3282170V01        | Gasket RF (32 used)                                |
| 13                                   | 3282835X01        | Gasket RF Diecut                                   |
|                                      | 3283322X01        | Gasket,BNC   |
|                                      | 5485282U01        | Label, Barcode                                     |
| THN6764A MODULE HOUSING EXCITER      |                   |  |
|                                      | 0383498N14        | Screw, tapping: M4 x 0.7 x 18 (5 used)             |
| 15                                   | 1582631X02        | Housing Exciter Bottom Casting                     |
| 16                                   | 1582632X02        | Housing Exciter Top Casting                        |
| 9                                    | 3282170V01        | Gasket RF (33 used)                                |
| 13                                   | 3282835X01        | Gasket RF Diecut                                   |
|                                      | 3283322X01        | Gasket,BNC   |
|                                      | 5485282U01        | Label, Barcode                                     |
| THN6785A MODULE HOUSING PA LOW POWER |                   |  |
|                                      | 0310907A19        | Machine Screw (M3X0.5X8) INT STRPAN STL (24 used)  |
|                                      | 0310907A40        | Machine Screw (M4X0.7X25) STRPAN STLCAD (8 used)   |
|                                      | 0383498N05        | SCREW, tapping: M4 x 0.7 x 12 SLTSTAR STL (2 used) |
|                                      | 0783544X01        | Bracket, OMNI                                      |
|                                      | 0900816159        | Connector, receptacle: coaxial                     |
| 18                                   | 1582626X02        | Cover PA & PS Casting                              |
| 19                                   | 2682624X06        | Heatsink Low Power Amp                             |
|                                      | 3082728X05        | CBL 6-WIRE   |
|                                      | 3282170V01        | Gasket RF (56 used)                                |
|                                      | 4280500F01        | T & R Version of 4282981X01 (Strap PA Braided)     |
|                                      | 5482006W01        | Label, PCB barcode                                 |
|                                      | 5483323X01        | Label, Freq. Ref.                                  |

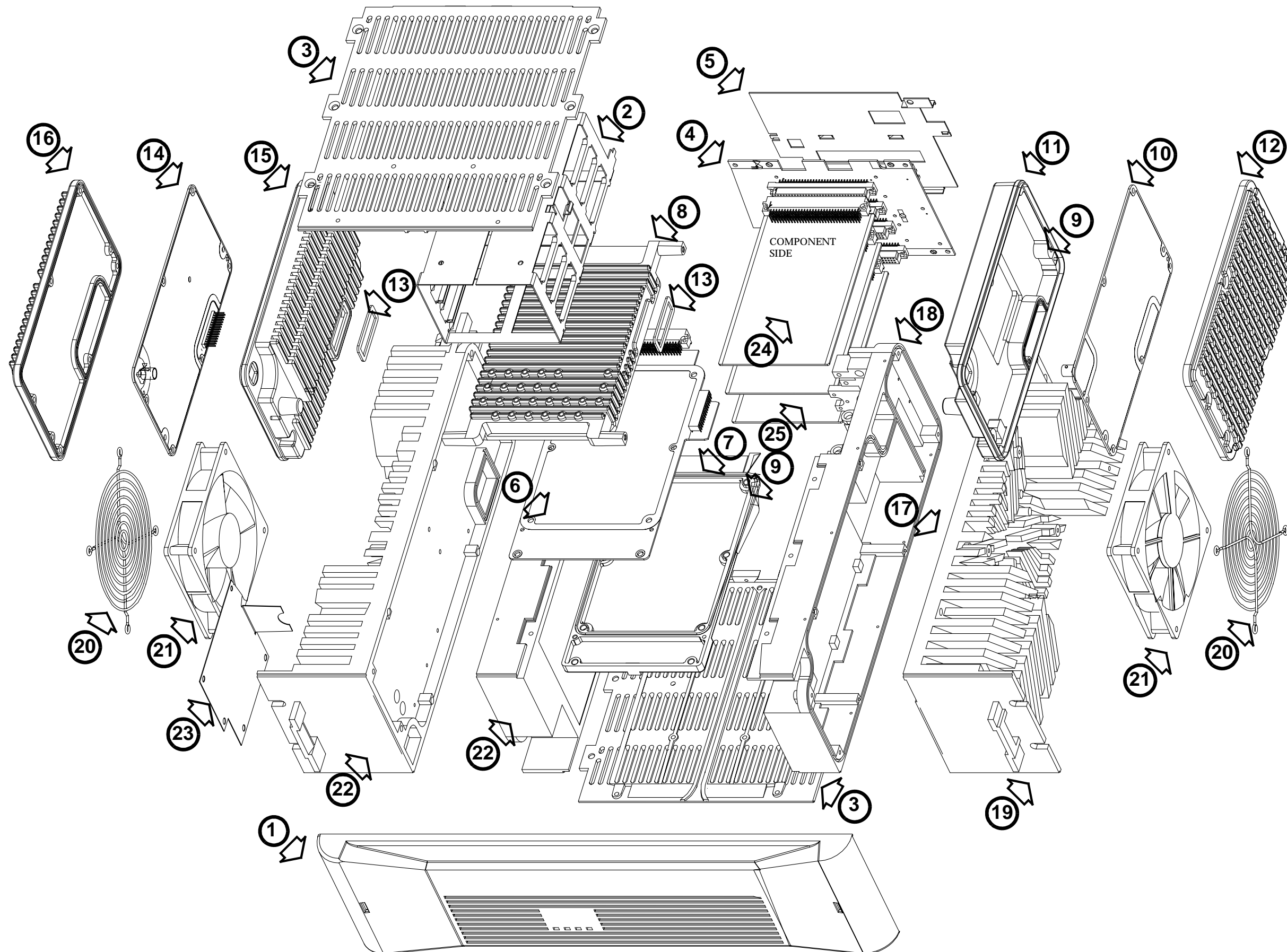
VHF STATION OVERVIEW

| REFERENCE NUMBER                      | MOTOROLA PART NO. | DESCRIPTION   |
|---------------------------------------|-------------------|---|
| THN6786A MODULE HOUSING PA HIGH POWER |                   |   |
|                                       | 0310907A19        | SCRMCH(M3X0.5X8) INT STRPAN STL (26 used)               |
|                                       | 0310907A40        | SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)                 |
|                                       | 0310907C66        | SCRMCH M4X0.7X45MM STLCAD (4 used)                      |
|                                       | 0310917A51        | SCRMCH M3.5X0.6X12 STPN STLZNC (3 used)                 |
|                                       | 0783544X01        | BRACKET, OMNI   |
|                                       | 0900816159        | CONNECTOR, receptacle: coaxial                          |
| 20                                    | 1383852R01        | GRILLE, fan   |
| 18                                    | 1582626X02        | COVER PA & PS CASTING                                   |
|                                       | 2182805H05        | 1000 pF, ±0%; 200V (2 used)                             |
| 19                                    | 2682624X05        | Heatsink High Power Amp                                 |
|                                       | 3082728X05        | CBL 6-WIRE  |
| 9                                     | 3282170V01        | GASKET RF (56 used)                                     |
|                                       | 5482006W01        | Label, PCB barcode                                      |
|                                       | 5483323X01        | LABEL, FREQ. REF.                                       |
| 21                                    | 5983663R09        | FAN DC 1" THK X120MMX120MM                              |
| DLN6622A FRU 500W AC POWER SUPPLY     |                   |   |
| 22                                    | TPN6196B          | Power Supply AC 500W Main Board                         |
|                                       | 0182516W10        | Power Supply AC/DC 500W 50/60M23 Out                    |
|                                       | 0310943J21        | Screw, tapping: TT4 X 0.7 x 10 (2 used)                 |
| 23                                    | 1583305X01        | Cover, Power Lock Connector                             |
| DLN6624A FRU 250W AC POWER SUPPLY     |                   |   |
| 22                                    | TPN6197B          | Power Supply AC 250W Main Board                         |
|                                       | 0182516W09        | Power Supply AC/DC 250W 50/60HZ                         |
|                                       | 0310943J21        | Screw, tapping: TT4 X 0.7 x 10 (2 used)                 |
| 23                                    | 1583305X01        | Cover, Power Lock Connector                             |
| CLN1222A FRU 500 WATT DC ONLY PS      |                   |   |
| 22                                    | CPN6059A          | Power Supply DC 500W                                    |
|                                       | CPN6060A          | Cable, DC Power Input                                   |
|                                       | 0182516W04        | Power Supply DC Only 28V 500W                           |
|                                       | 0310943J21        | Screw, tapping: TT4 X 0.7 x 10 (2 used)                 |
|                                       | 3082009X02        | Cable, DC Power-INW/30A Fuse                            |
| CLN1223A FRU 250 WATT DC ONLY PS      |                   |   |
| 22                                    | CPN6058A          | Power Supply, DC, 250W                                  |
|                                       | CPN6060A          | Cable, DC Power Input                                   |
|                                       | 0182516W03        | Power Supply, DC ONLY 14V 250W                          |
|                                       | 0310943J21        | Screw, tapping: TT4 X 0.7 x 10 (2 used)                 |
|                                       | 3082009X02        | Cable, DC Power-INW/30A Fuse                            |
| STATION BOARDS                        |                   |   |
| 4                                     | TTN5062B          | Backplane Board   |
| 6                                     | TCN6273K          | Controller Board  |
| 10                                    | TRD6411C          | Receiver, High Band Board Without Internal Pre Selector |
| 10                                    | TRD6431C          | Receiver, High Band Board                               |
| 14                                    | TTD6301C          | Exciter, High Band Board                                |
| 17                                    | TTD1921A          | 30 W P A High Band Board                                |
| 17                                    | TTD1781A          | 40 W P A High Band Board                                |
| 17                                    | CLD1301A          | 100 W P A Board (132 to 154 MHz)                        |
| 17                                    | CLD1300A          | 100 W P A Board (150 to 174 MHz)                        |
| 24                                    | TTN5066B          | 4 Wire Euro Wireline Board                              |
| 24                                    | TTN5067B          | 4 Wire Wireline Board With DC Remote                    |
| 24                                    | TTN5068A          | 8 Wire Wireline Board                                   |
| 25                                    | CLN6698B          | Auxiliary I/O Board                                     |

**Note:** Power supply kits are available only as FRU kits and will be serviced by the vendor i.e. Astec.

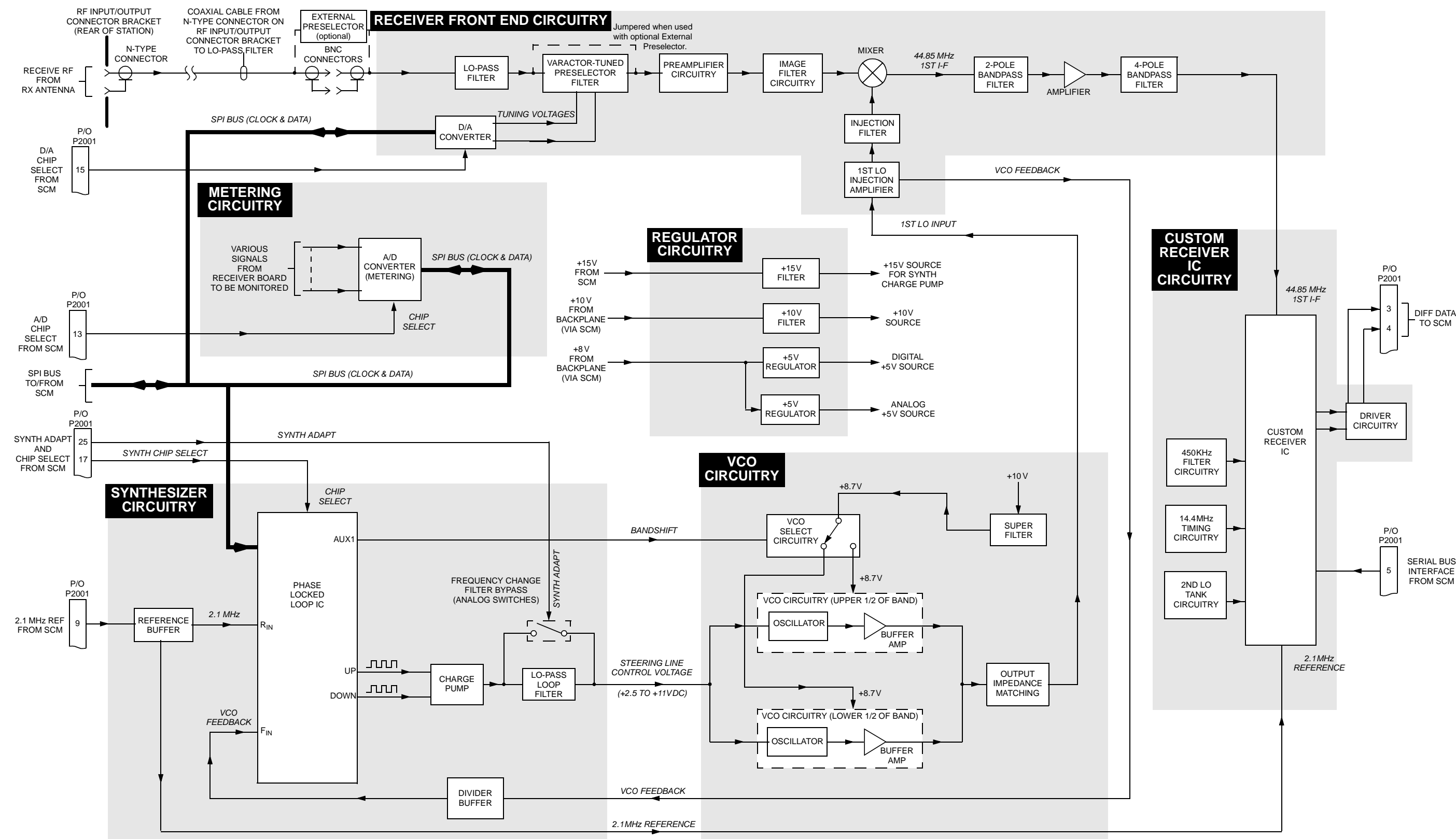
# STATION OVERVIEW

VHF (132 TO 174 MHz)





RECEIVER MODULE  
MODEL TRD6431C/TRD6411C

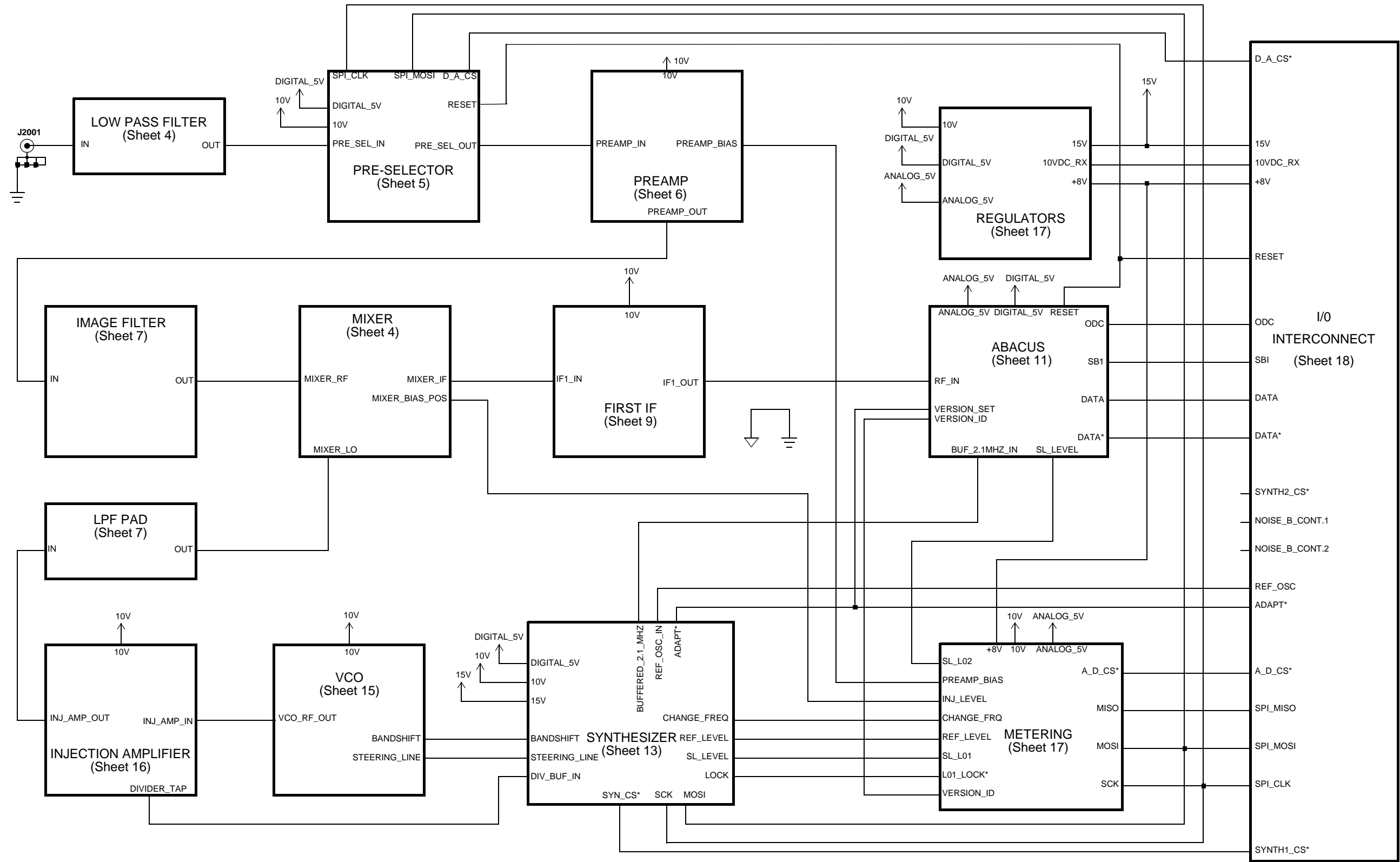


VHF RECEIVER FUNCTIONAL BLOCK DIAGRAM

**RECEIVER MODULE**  
**MODEL TRD6431C/TRD6411C**

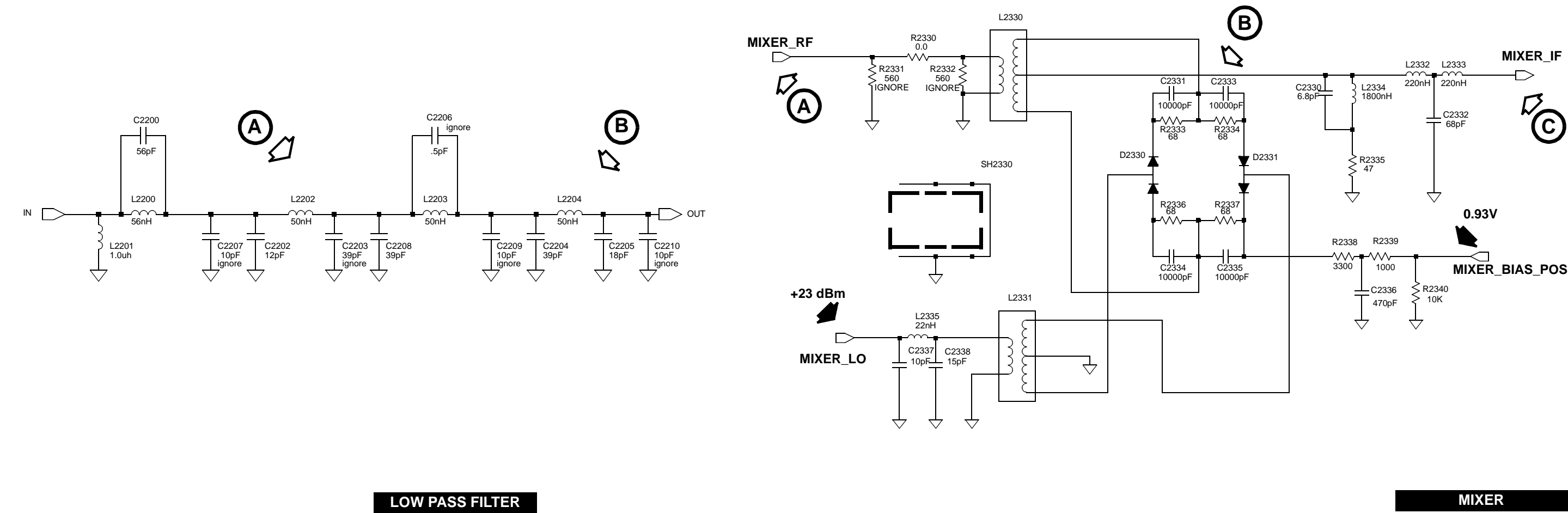
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RECEIVER MODULE  
MODEL TRD6431C/TRD6411C



RECEIVER BLOCK DIAGRAM

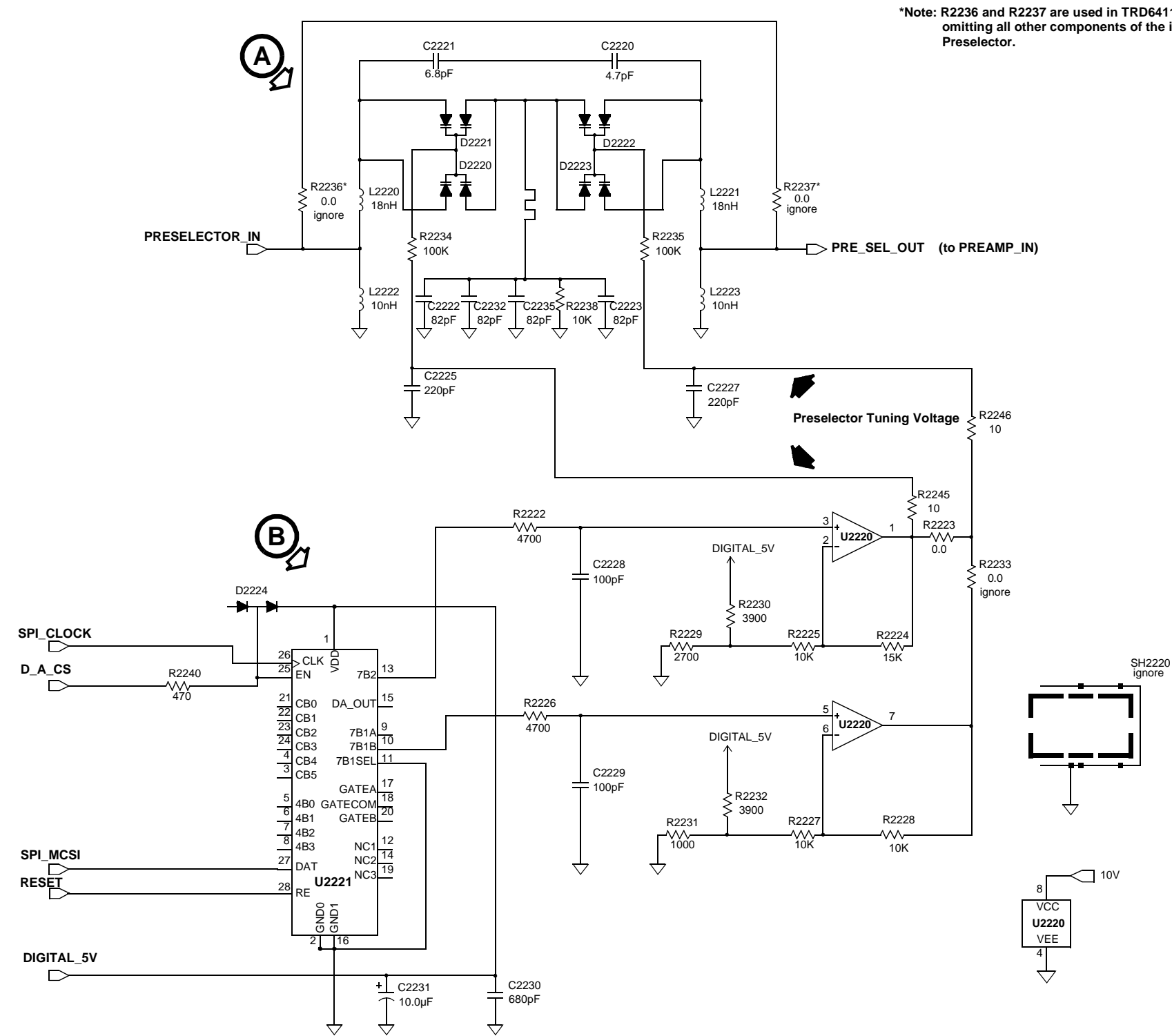
RECEIVER MODULE  
MODEL TRD6431C/TRD6411C



| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| <b>A</b>    | The receiver input filter consists of a 7-pole Tscbebycheff filter with cut-off frequency of 185 Mhz.L2200/C2200 notches frequencies around 90Mhz. Pass band insertion loss is approximately 0.5dB. Input and output are both approximately 50 Ohm. |
| <b>B</b>    | Output to internal preselector input on TRD6431A and pre-amplifier input on TRD6411A  |

| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| <b>A</b>    | Rx signal input from image filter   |
| <b>B</b>    | Input Rx signal is multiplied with the injection signal. This results in a down conversion (Injection frequency - Rx frequency) to IF frequency of 44.85 MHz.   |
| <b>C</b>    | IF output to IF amplifier:<br>The IF signal passes the Duplexer network of L2234/C2330/R2335 which matches all frequencies (except the IF) to 50 Ohms (R2335) and first IF filter (L2332/L2333/C2332) |

RECEIVER MODULE  
MODEL TRD6431C/TRD6411C

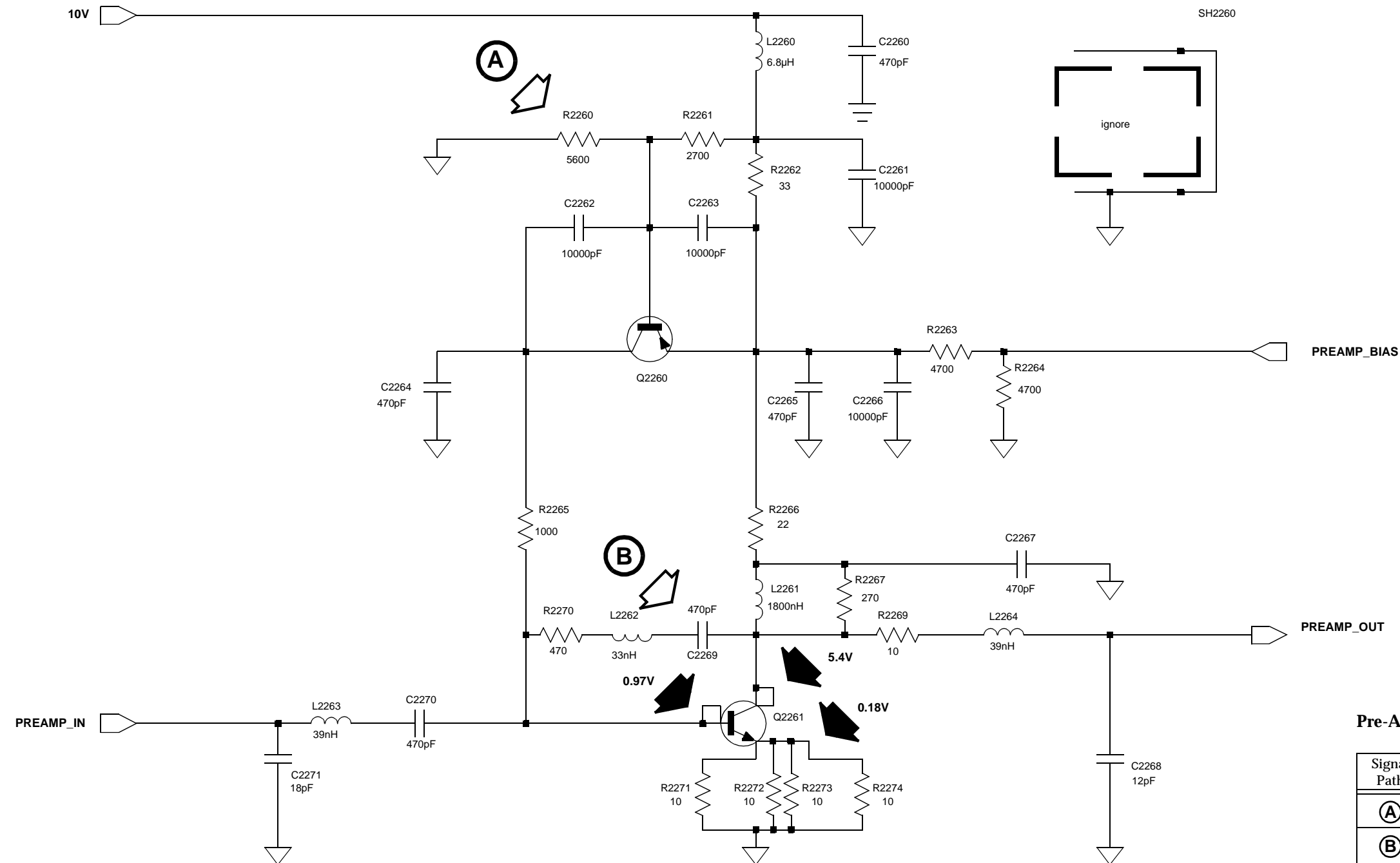


| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | The varactor tuned 2-pole filter is steered by the control voltage of the 7-bit D/A converter U2221. Control voltage varies from approx. 1.4V @ 132Mhz up to approx. 5.5V @ 174Mhz(factory aligned). Input and output are both approx. 50 Ohm. R2236 and R2237 are needed for TRD6411A to bypass the tuned filter. |
| Ⓑ           | The 7-bit D/A converter gets its data via SPI_MOSI and the clock via SPI_CLK. The OP amp U2220 converts the output voltage of the D/A converter to the tuned 2-pole filter.  |

PRE SELECTOR

# RECEIVER MODULE

## MODEL TRD6431C/TRD6411C



## Pre-Amplifier Service Notes

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| (A)         | Preamp constant current source.<br>Typical current is approx. 75mA.  |
| (B)         | Preamplifier provides approx. 16dB gain.<br>Input and output are approx. 50 Ohm.<br>Intercept point of preamp is approx. +17dBm. |

## PRE AMPLIFIER

RECEIVER MODULE  
MODEL TRD6431C/TRD6411C

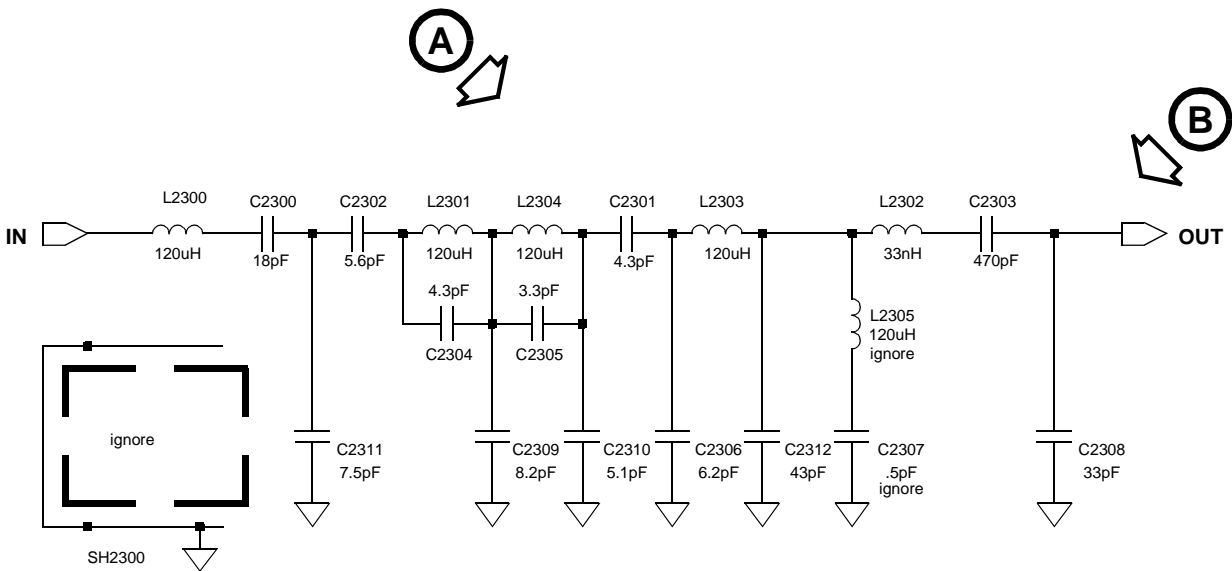
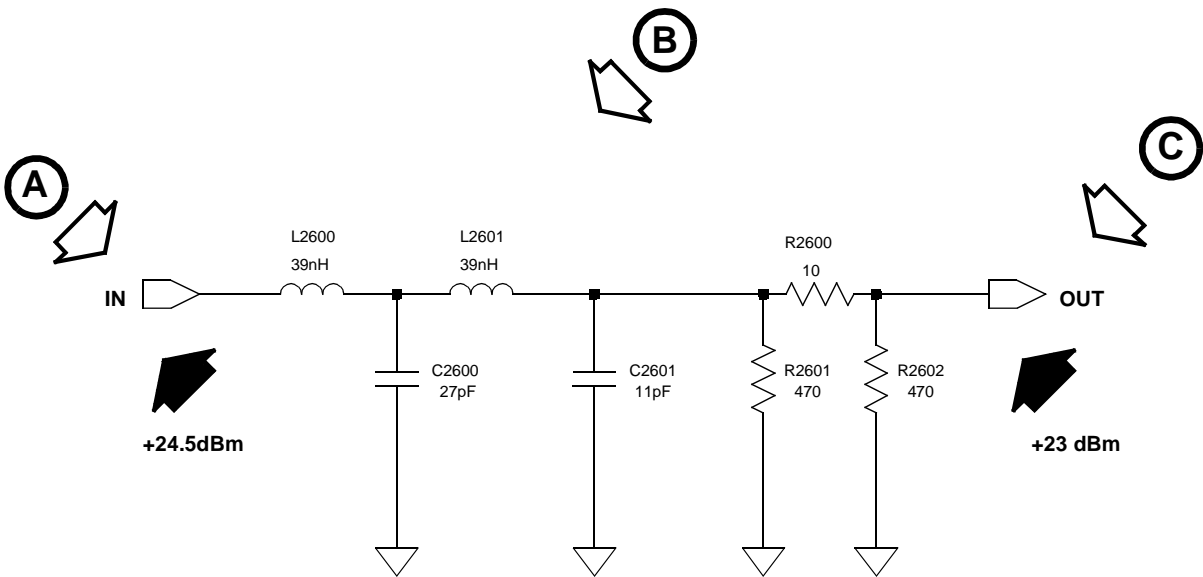


IMAGE FILTER

Image Filter Service Notes

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| (A)         | 5-pole band pass with 2 band stops suppresses image frequency. Provides wide band spur suppression and matches preamp and mixer. Input and output are both approximately 50 Ohm. |
| (B)         | Output of Image Filter to Mixer Rf port.   |



2dB PAD

2dB Pad Service Notes

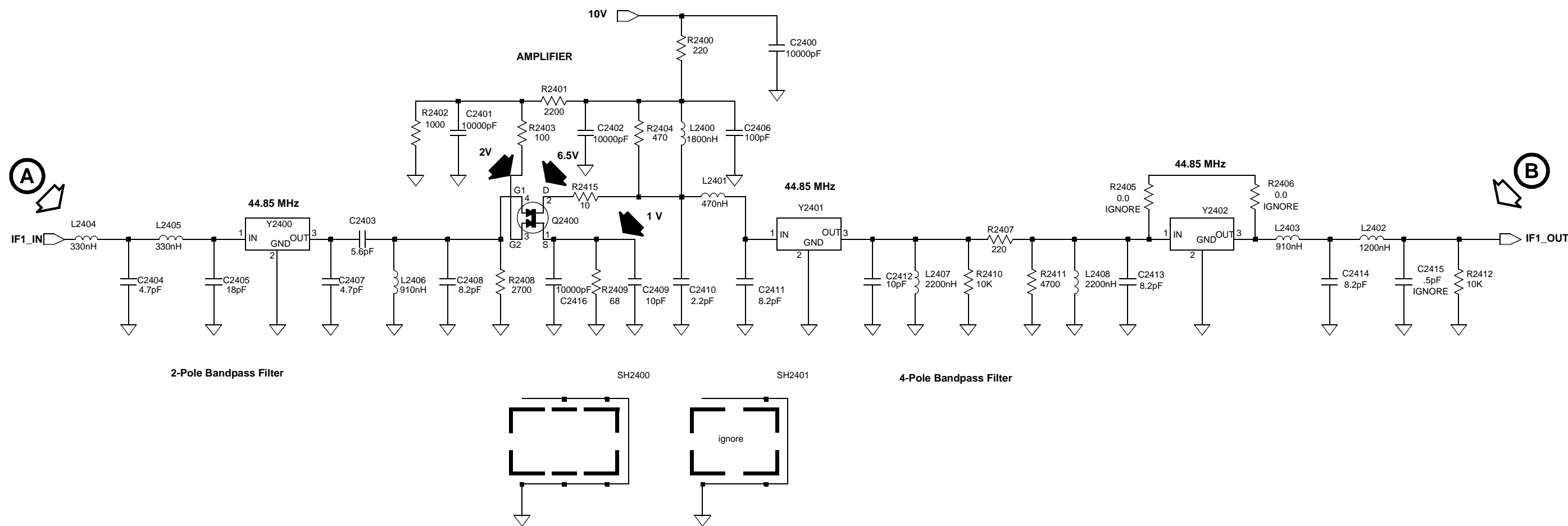
| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| (A)         | Injection signal input from injection amplifier.  |
| (B)         | The 2dB Pad provides filtering of the Injection signal and matching to the mixer LO port. The attenuation of the pad is approximately 1.7dB. It is used as a broadband resistive load |
| (C)         | Injection output to Mixer LO port.  |

**RECEIVER MODULE**  
**MODEL TRD6431C/TRD6411C**

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RECEIVER MODULE  
MODEL TRD6431C/TRD6411C



First IF Service Notes

| Signal Path | Description/Nominal Signal Levels        |
|-------------|--|
| Ⓐ           | Input of First IF from Mixer IF port.    |
| Ⓑ           | Output of First IF to Abacus Rf In port. |

FIRST IF

RECEIVER MODULE

MODEL TRD6431C/TRD6411C

U2500 (ABACUS) PINOUT TABLE

| Pin # | Pin Name | Signal Type | Pin Description          |
|-------|----------|-------------|--------------------------|
| 1     | ODC      | Output      | Output data clock        |
| 2     | VDDH     | Power       | Digital supply           |
| 3     | DGND     | Power       | Digital ground           |
| 4     | VDD      | Output      | Int. reg. digital 3V     |
| 5     | VSSR     | Power       | Substrate ring           |
| 6     | OVCC     | Power       | Oscillator supply        |
| 7     | OGND     | Power       | Oscillator ground        |
| 8     | OB       | Output      | Oscillator bias          |
| 9     | OTBY     | Input       | Oscillator tank bypass   |
| 10    | OT       | Input       | Oscillator tank          |
| 11    | SSL      | Output      | Oscillator steering line |
| 12    | SUB      | Power       | Substrate                |
| 13    | REFI     | Input       | Reference input          |
| 14    | VCC      | Power       | Analog supply            |
| 15    | GND      | Power       | Analog ground            |
| 16    | DAF2     | Output      | DAC filter cap 2         |
| 17    | NLS      | Input       | Nominal DAC level set    |
| 18    | DAF      | Output      | AC filter cap            |
| 19    | DAFG     | Output      | DAC filter cap           |
| 20    | IFI      | Power       | IF isolation             |
| 21    | BYP2     | Output      | Mobile IF preamp bypass  |
| 22    | BYP1     | Output      | Mobile IF preamp bypass  |
| 23    | VCCP2    | Power       | Mobile IF amp supply     |
| 24    | IFIN2    | Input       | Mobile IF input          |
| 25    | GNDI     | Power       | IF input ground          |
| 26    | IFIN     | Input       | Portable IF input        |
| 27    | VCCP     | Power       | Portable IF amp supply   |
| 28    | LOx      | Input       | LO input bypass          |
| 29    | LO       | Input       | LO input                 |
| 30    | GNDO     | Power       | IF output ground         |
| 31    | MOx      | Output      | Mixer output             |
| 32    | MO       | Output      | Mixer output             |
| 33    | T1C2     | Power       | 1st tank supply          |
| 34    | T1C      | Power       | 1st tank supply          |
| 35    | T1x      | Output      | 1st tank input           |
| 36    | T1       | Output      | 1st tank input           |
| 37    | T2C      | Power       | 2nd tank supply          |
| 38    | T2x      | Output      | 2nd tank input           |
| 39    | T2       | Output      | 2nd tank input           |
| 40    | CAPx     | Output      | DC feedback cap          |
| 41    | CAP      | Output      | DC feedback cap          |
| 42    | VPP      | Power       | Supply for charge pump   |
| 43    | COL      | Input       | Internal osc device      |
| 44    | EMIT     | Output      | Internal osc device      |

U2500 (ABACUS) PINOUT TABLE (continued)

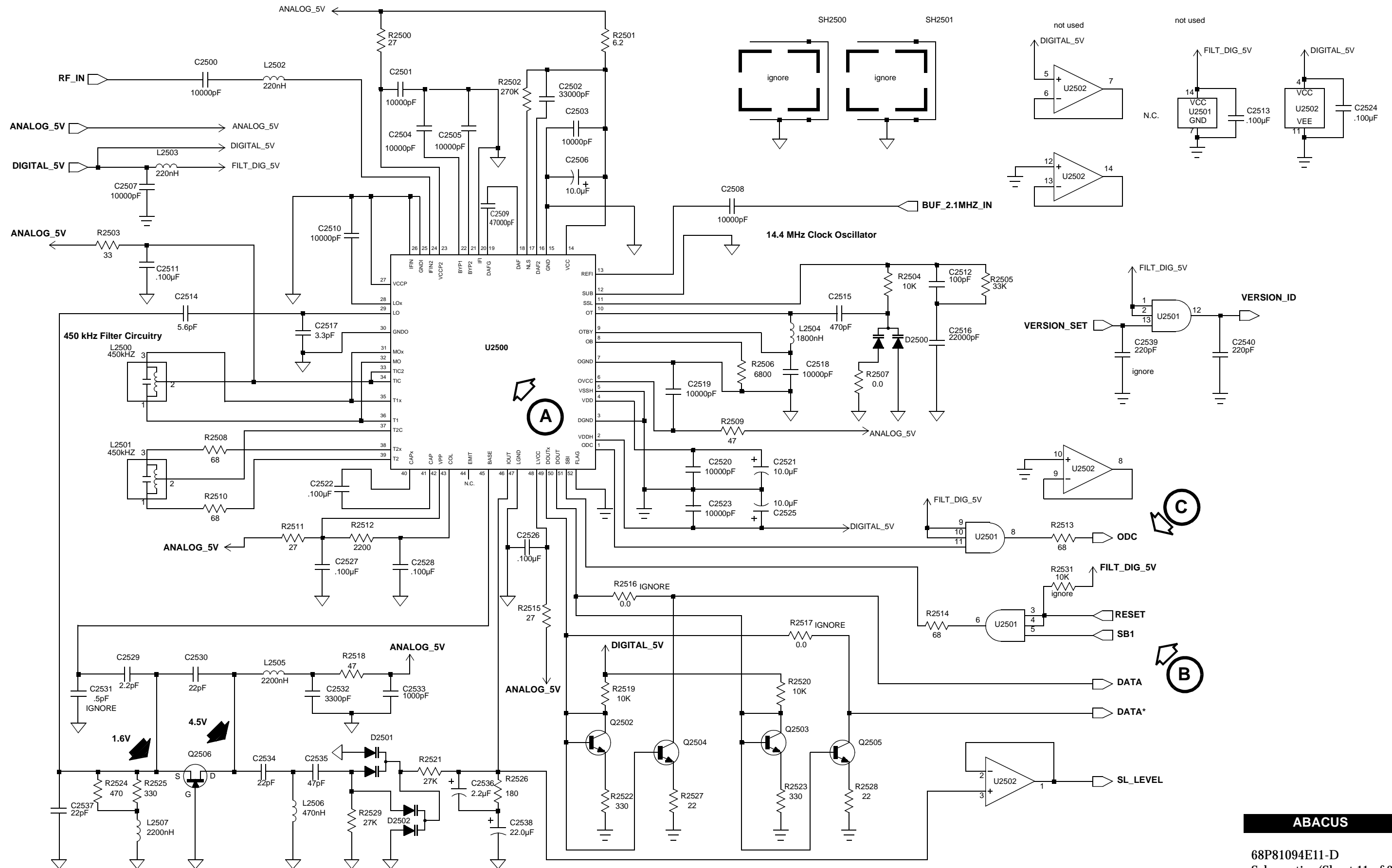
| Pin # | Pin Name | Signal Type | Pin Description          |
|-------|----------|-------------|--------------------------|
| 45    | BASE     | Input       | Internal osc device      |
| 46    | IOUT     | Output      | 2nd LO steering line     |
| 47    | LGND     | Power       | 2nd LO ground            |
| 48    | LVCC     | Power       | 2nd LO supply            |
| 49    | DOUTx    | Output      | Differential output data |
| 50    | DOUT     | Output      | Differential output data |
| 51    | SBI      | Input       | Serial bus input         |
| 52    | FLAG     | Power       | Cavity ground            |

Abacus Service Notes

| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| Ⓐ           | Custom Receiver IC provides 2nd conversion amplification and analog to digital conversion of the 2nd IF - Signal resulting in a differential data output from pins 49 and 50.   |
| Ⓑ           | Serial Bus Interface (SBI). It is used to program the functions of U2500, to set 2nd LO Frequency and alter internal gain.  |
| Ⓒ           | Output Data Clock (ODC) is used to clock the output data. For 20 and 33 1/3 ksamples/sec the ODC rate is 2.4 MHz and for 60 ksamples/sec the ODC rate is 4.8 MHz. (2.4 MHz and 20k samples/sec are used). The ODC is also used to clock the SBI word. |

# RECEIVER MODULE

## MODEL TRD6431C/TRD6411C



## ABACUS

68P81094E11-D  
Schematics (Sheet 11 of 27)  
12/26/01

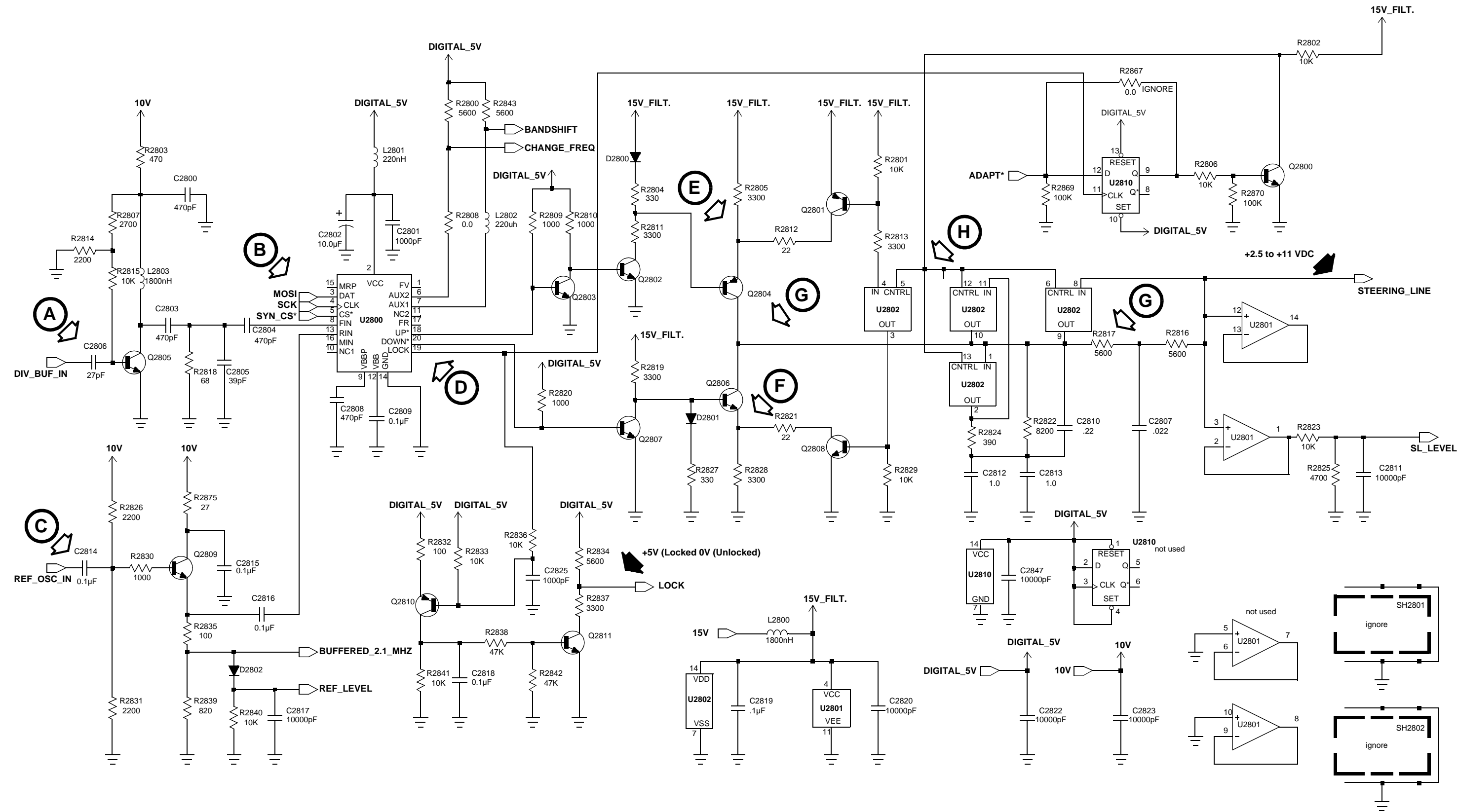
RECEIVER MODULE

MODEL TRD6431C/TRD6411C

| Signal Path | Description /Nominal Signal Levels   |
|-------------|--|
| Ⓐ           | A sample of the VCO output signal is fed to the VCO Divider Buffer Q3401 and output to the feedback input at U3402–pin 8.  |
| Ⓑ           | The MOSI serial data signal contains frequency selection data from the Host processor on the SCM. This data is clocked by the SCK signal.  |
| Ⓒ           | 2.1 MHz input from the SCM is buffered by Q2809 and fed to the Reference Input (RIN) of PLL synthesizer U2800–pin 13.  |
| Ⓓ           | PLL synthesizer U2800 compares the frequency of RIN (2.1 MHz from the SCM) and FIN (VCO feedback signal divided internally per programming data from station control via MOSI data line) and generates variable-width UP and DOWN pulses (pins 18 & 20). With the synthesizer locked, pins 18 & 20 generate extremely small pulse widths. With VCO <i>below</i> desired frequency, pin 18 pulse widths increase; with VCO <i>above</i> desired frequency, pin 20 pulse widths increase. The bandshift signal is at 5 V if the low range VCO is selected and at 0 V if the high range VCO is selected. (132 - 153.3MHz, 152.5 - 174 MHz). |
| Ⓔ           | +10V with narrow 0.8 V DOWN pulses at 5 kHz or 6.25 kHz rate when locked.  |
| Ⓕ           | 0 V with narrow 0.8 V UP pulses at 5 kHz or 6.25 kHz rate when locked.   |
| Ⓖ           | The charge pump and loop filter convert UP/DOWN pulses from the PLL IC to a dc steering voltage which is fed to dual VCO circuitry to control the VCO output frequency. Adapt* is pulsed low for the first 10 msec (small frequency jump) or 20 msec (large frequency jump) when the frequency is changed. While adapt* is low, analog switches U2802 are closed to bypass the loop filter for fast frequency change.  |
| Ⓕ           | When the synthesizer chip is being programmed the Adapt signal switches the loop filter cutoff frequency to a higher value for a preprogrammed period of time (15V at U2802 pin 5, 6, 12, 13). After that the level is at 0 V. U2810 synchronizes the Adapt signal with the synthesizer reference signal.  |

| Pin # | Signal Name              | Description /Nominal Voltage   |
|-------|--------------------------|--|
| 1     | FV                       | Test point; divided down VCO frequency; 6.25 KHz or 5KHz sawtooth waveform in locked condition |
| 2     | VCC                      | IC power; +5 V   |
| 3     | DATA                     | Serial data input; 0–5 V logic level   |
| 4     | CLK                      | Clock for serial data programming; 0–5 V logic level   |
| 5     | $\overline{\text{CS}}$   | Chip select; low when programming, high when not programming; 0–5 V logic level                |
| 6     | AUX2                     | Change frequency; toggles between logic low and high with every frequency change               |
| 7     | AUX1                     | Bandshift; high selects low frequency VCO; low selects high frequency VCO                      |
| 8     | FIN                      | Feedback rf input; transmit operating frequency riding on 1.4 V                                |
| 9     | VBBP                     | DC bias for prescaler input; 1.4 V   |
| 10    | NC1                      | Not used   |
| 11    | NC2                      | Not used   |
| 12    | VBB                      | DC bias for reference divider input; 1.4 V   |
| 13    | RIN                      | Reference divider input; 1 Vp-p, 2.1 MHz square wave riding on 1.4 V                           |
| 14    | GND                      | IC ground; 0 V   |
| 15    | NC3                      | Not used   |
| 16    | NC3                      | Not used   |
| 17    | FR                       | Test point; divided down 2.1 MHz reference @ 6.25 KHz or 5KHz in a locked condition.           |
| 18    | $\overline{\text{UP}}$   | When locked, narrow (<1 microsecond) down pulses @ 6.25 KHz or 5KHz riding on 0.7 V            |
| 19    | $\overline{\text{LOCK}}$ | Loop locked; when locked, narrow (<1 microsecond) down pulses @ 6.25 KHz or 5KHz riding on 5 V |
| 20    | $\overline{\text{DOWN}}$ | When locked, narrow (<1 microsecond) down pulses @ 6.25 KHz or 5KHz riding on 0.7 V            |

RECEIVER MODULE  
MODEL TRD6431C/TRD6411C



SYNTHESIZER

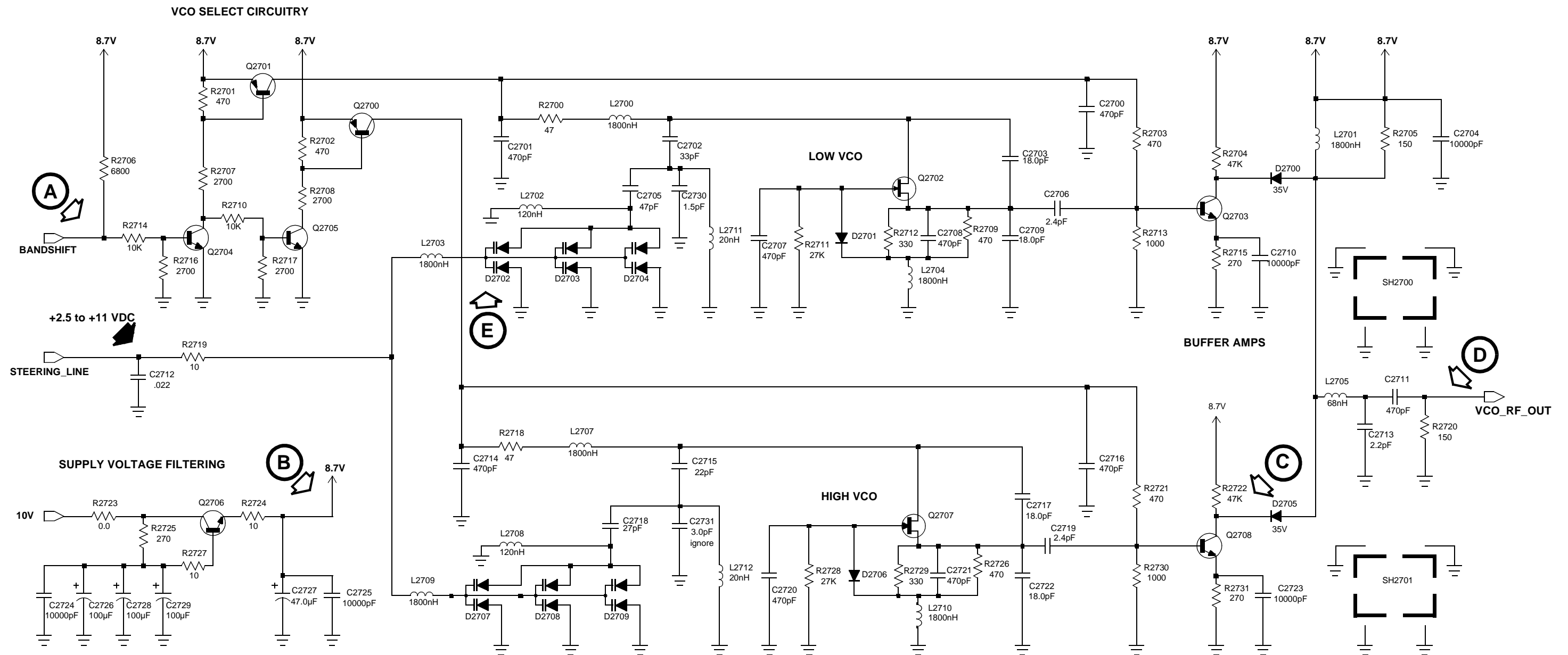
# RECEIVER MODULE

## MODEL TRD6431C/TRD6411C

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| (A)         | Bandshift signal from synthesizer (U2809, AUX1) controls series pass transistor Q2700 and Q2701 to provide supply voltage to high VCO (upper half of band) or low VCO (lower half of band).<br>Bandshift signal Hi      Low range VCO selected;<br>Bandshift signal Lo      High range VCO selected;   |
| (B)         | Superfilter with Q2706 provides active filtering of noise on the 10V supply voltage to improve noise performance of VCO's. Filtered output voltage is 8.7V.  |
| (C)         | Enabled VCO (selected by VCO select circuitry) generates RF output frequency determined by the DC control voltage at steering line.  |
| (D)         | 1st LO injection: 176.85 - 197.85 MHz (low band)<br>197.85 - 218.85 MHz (high band)<br>Output power at this point between +3dBm and +9dBm.   |
| (E)         | The frequency of the VCO's is tuned with D2702 thru D2704 for low band and D2707 thru D2709 for high band.<br>If synthesizer is not locked, the steering line voltage will be either less than 2.5V or higher than 11V.<br>Low range VCO enabled:<br>Steering line voltage 5V                  approx. 177MHz<br>Steering line voltage 9.5V                approx. 198MHz<br><br>High range VCO enabled:<br>Steering line voltage 5V                  approx. 198MHz<br>Steering line voltage 9.5V                approx. 219MHz |
|             | <b>Note: measure steering line voltage at U2801, Pin14.</b>  |

# RECEIVER MODULE

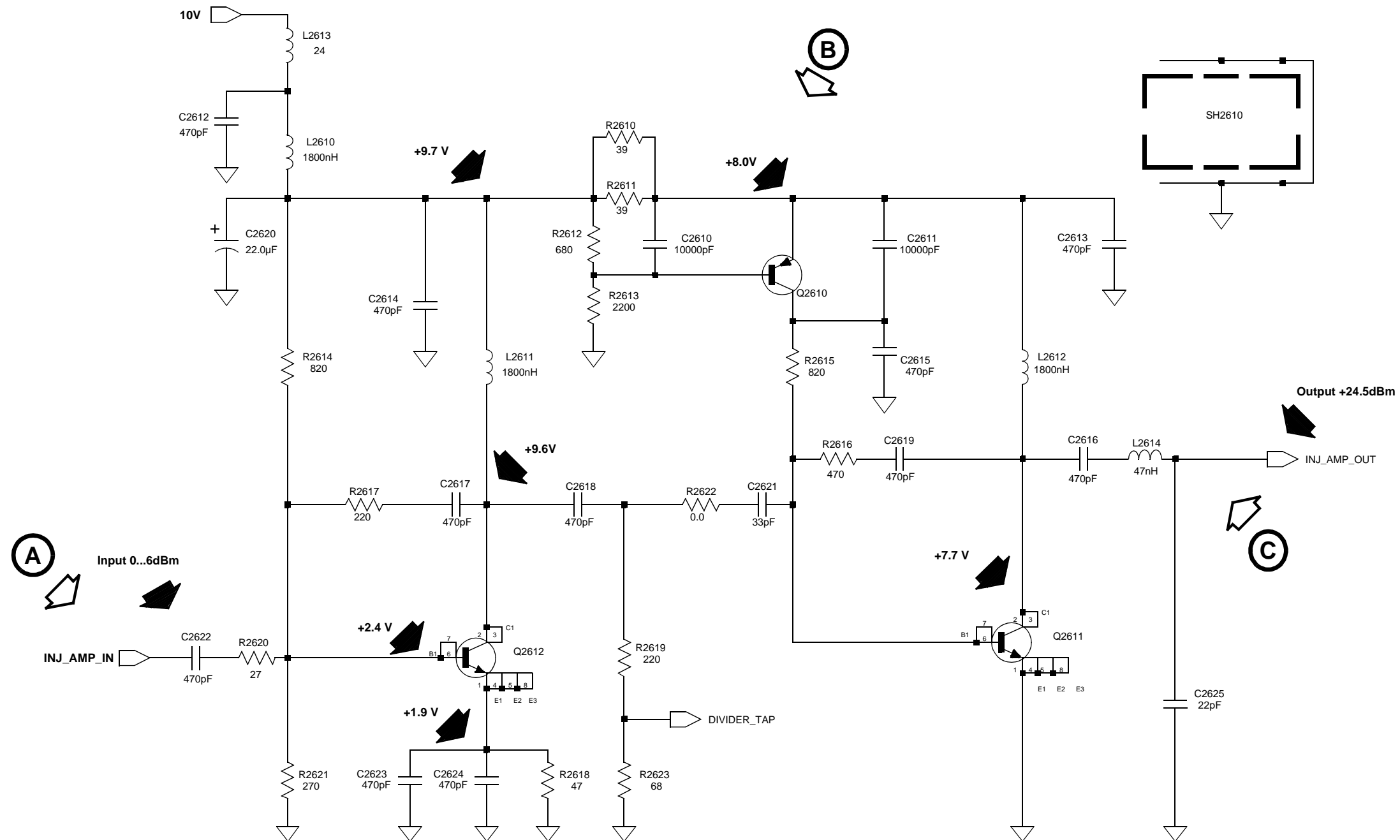
## MODEL TRD6431C/TRD6411C



VCO

# RECEIVER MODULE

## MODEL TRD6431C/TRD6411C

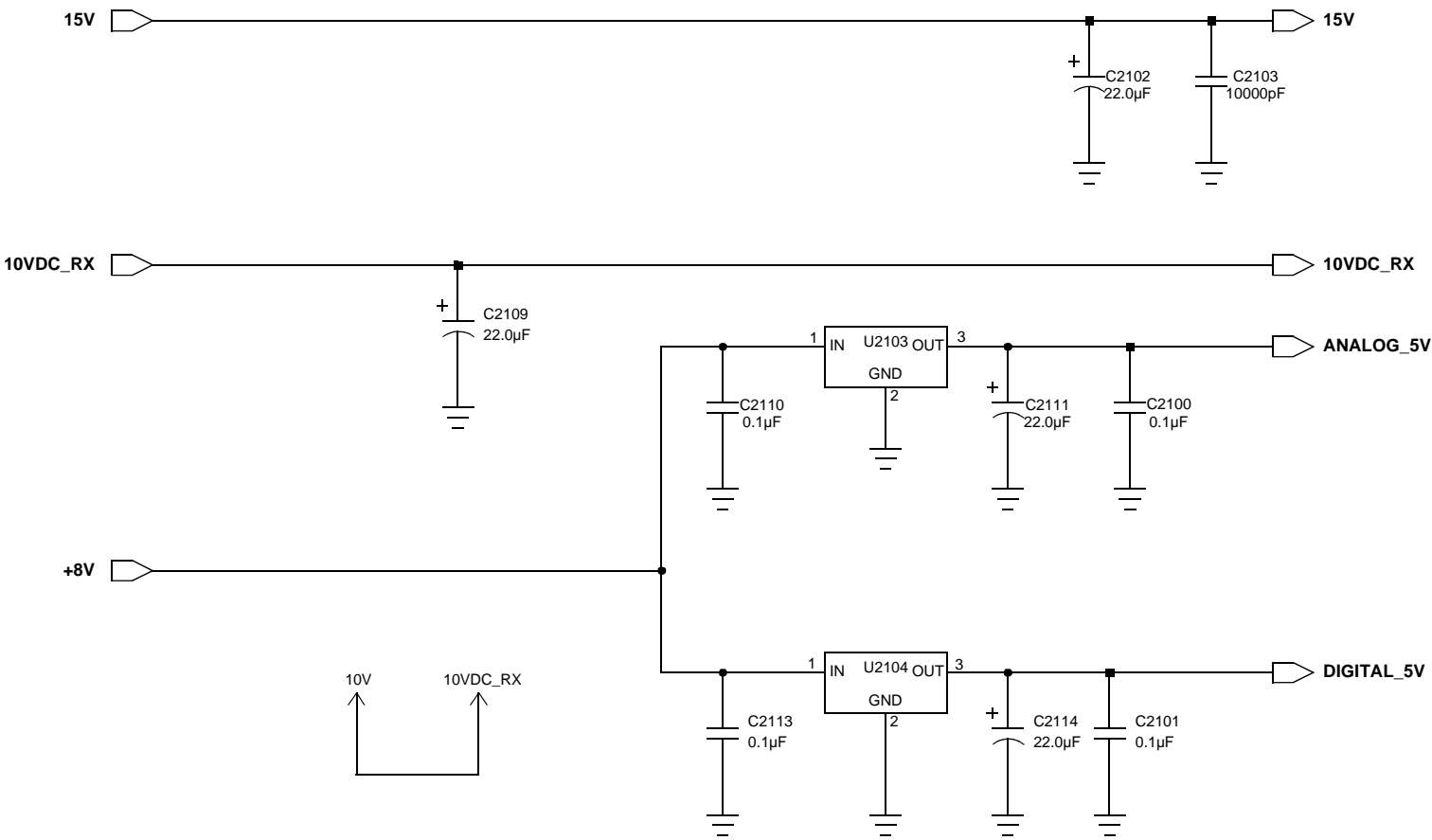
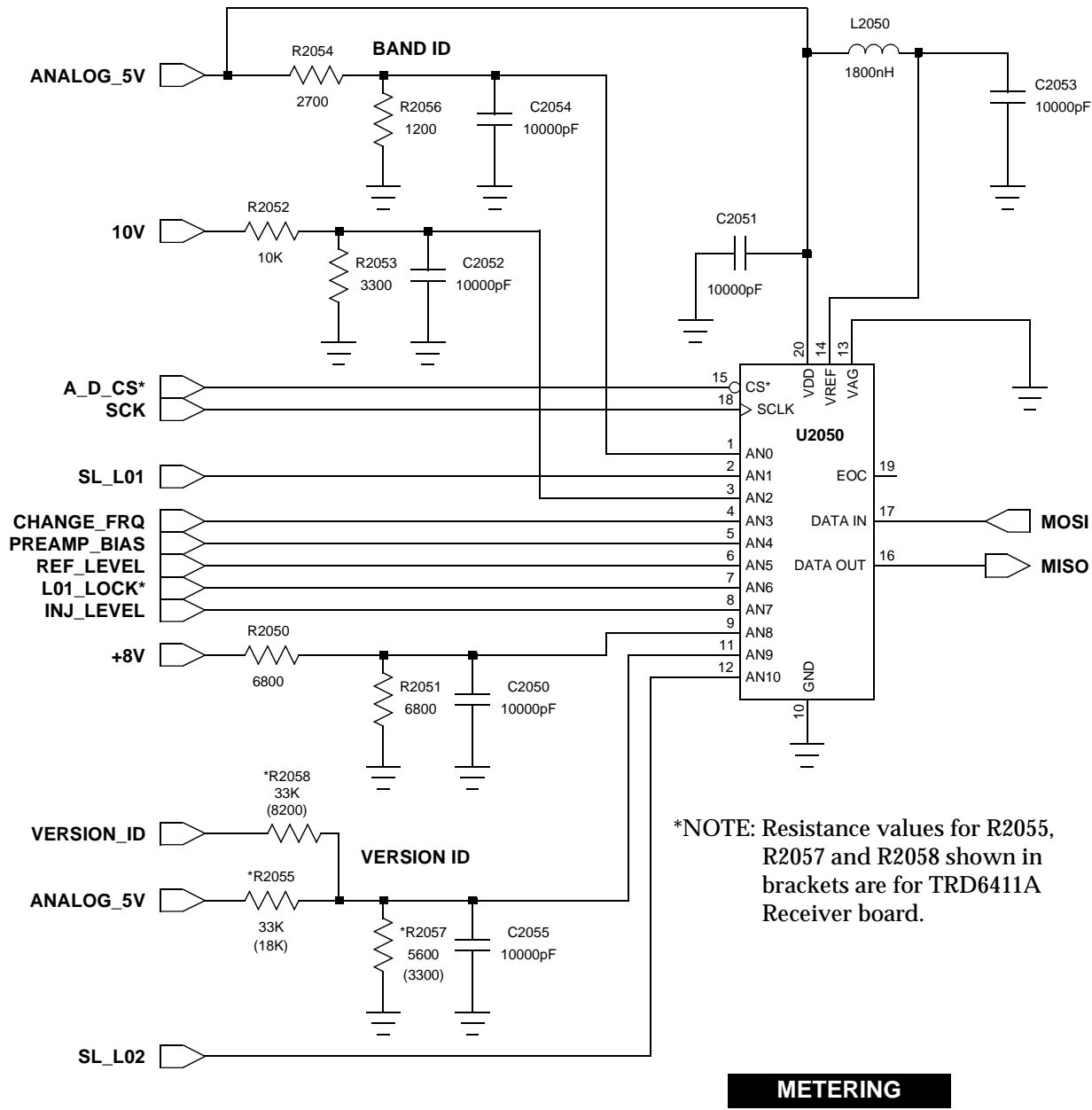


| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | VCO-signal input   |
| Ⓑ           | The RF-amplifier consists of Q2612/Q2611 with approximately 12dB power gain per stage. Current control for Output transistor (IC appr. 90mA) is provided by Q2610. |
| Ⓒ           | RF-output to Mixer   |

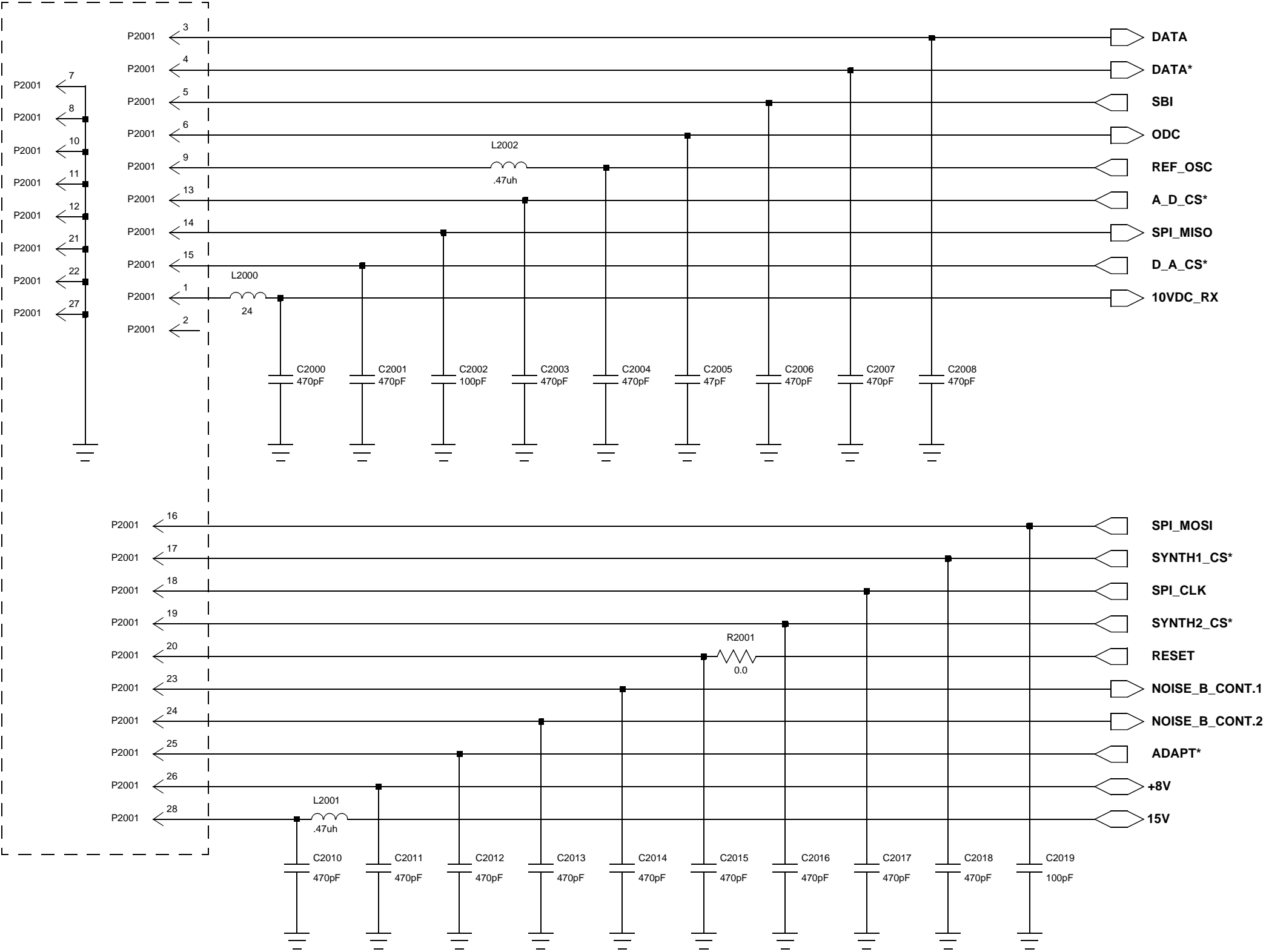
## INJECTION AMPLIFIER



RECEIVER MODULE  
MODEL TRD6431C/TRD6411C



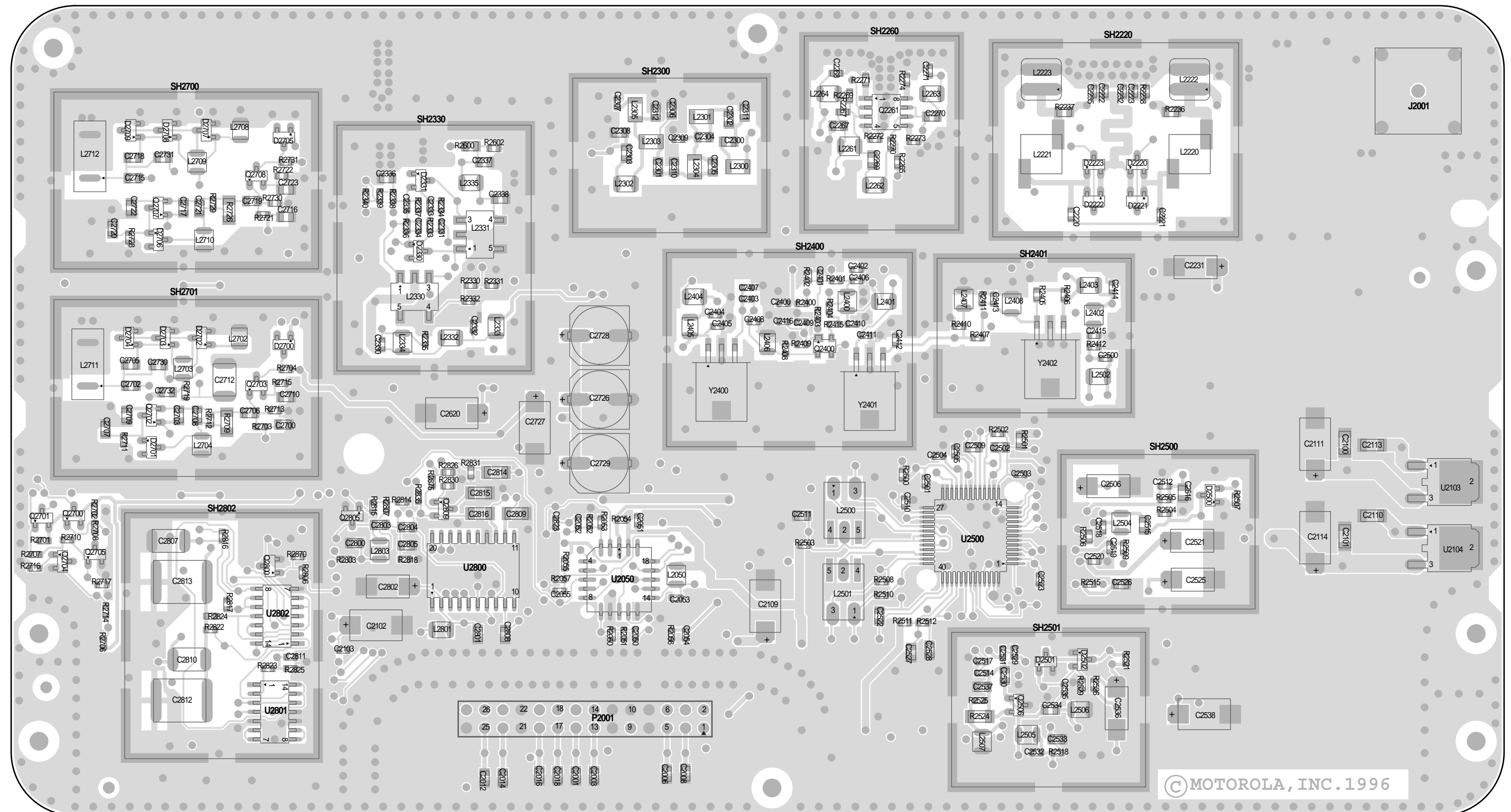
RECEIVER MODULE  
MODEL TRD6431C/TRD6411C



I/O INTERCONNECT

# RECEIVER MODULE

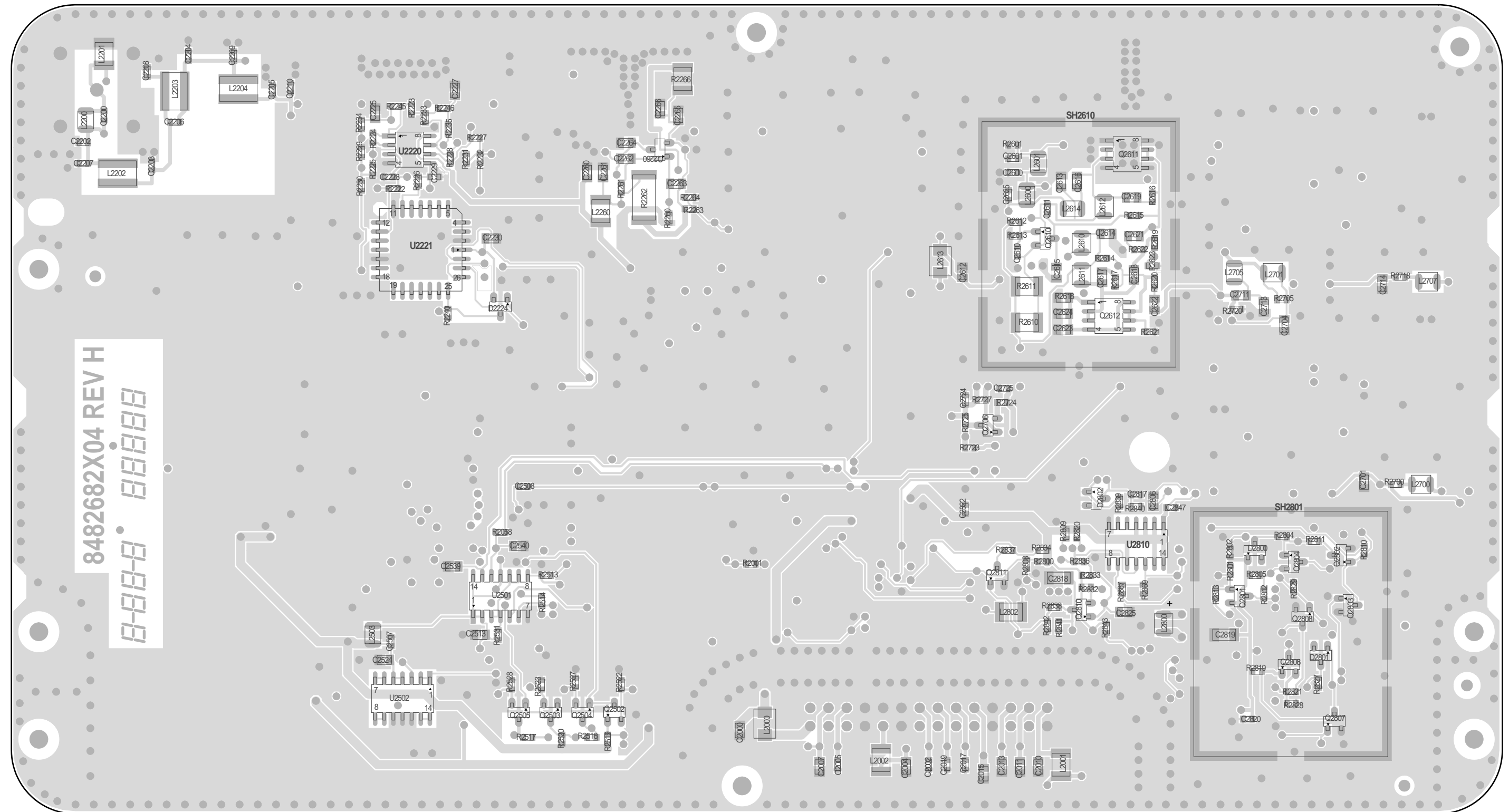
## MODEL TRD6431C/TRD6411C



VHF RECEIVER BOARD DETAIL HEAVY COMPONENT SIDE

## RECEIVER MODULE

### MODEL TRD6431C/TRD6411C



### VHF RECEIVER BOARD DETAIL LIGHT COMPONENT SIDE

# Parts List

## TRD6411C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION                            |
|---|-------------------|--|
| <b>TRD6411C RECEIVER VHF R1 W/O PRESEL</b>                                      |                   |  |
| <b>CAPACITOR, FIXED: <math>\mu\text{F}</math> <math>\pm 10\%</math>; 100 V:</b> |                   |  |
| UNLESS OTHERWISE STATED   |                   |  |
| C2000,2001  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2002   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C2003,2004  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2005   | 2113740F43        | 47 pF, $\pm 5\%$ ; 50V                 |
| C2006 thru 2008   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2010 thru 2016   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2017   | 2113741F17        | 470 pF, $\pm 5\%$ ; 50V                |
| C2018   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2019   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C2050 thru 2055   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2100,2101  | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2102   | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2103   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2109   | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2110   | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2111   | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2113   | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2114   | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2200   | 2113740F45        | 56 pF, $\pm 5\%$ ; 50V                 |
| C2202   | 2113740F29        | 12 pF, $\pm 5\%$ ; 50V                 |
| C2204   | 2113740F41        | 39 pF, $\pm 5\%$ ; 50V                 |
| C2208   | 2113740F41        | 39 pF, $\pm 5\%$ ; 50V                 |
| C2210   | 2113740F31        | 15 pF, $\pm 5\%$ ; 50V                 |
| C2260   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2261 thru 2263   | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2264,2265  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2266   | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2267   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2268   | 2113740F29        | 12 pF, $\pm 5\%$ ; 50V                 |
| C2269,2270  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2271   | 2113740F33        | 18 pF, $\pm 5\%$ ; 50V                 |
| C2300   | 2113740G35        | 18 pF, $\pm 2\%$ ; 50V                 |
| C2301   | 2113740G18        | 4.3 pF, $\pm 0.1$ pF; 50V              |
| C2302   | 2113740G21        | 5.6 pF, $\pm 0.1$ pF; 50V              |
| C2303   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2304   | 2113740G18        | 4.3 pF, $\pm 0.1$ pF; 50V              |
| C2305   | 2113740G15        | 3.3 pF, $\pm 0.1$ pF; 50 V             |
| C2306   | 2113740A23        | 6.2 pF, $\pm 0.25$ pF; 50V             |
| C2308   | 2113740G41        | 33 pF, $\pm 1\%$ ; 50V                 |
| C2309   | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V             |
| C2310   | 2113740G20        | 5.1 pF, $\pm 0.1$ pF; 50V              |
| C2311   | 2113740G25        | 7.5 pF, $\pm 0.1$ pF; 50V              |
| C2312   | 2113740A44        | 43 pF, $\pm 5\%$ ; 50V                 |
| C2330   | 2113740F23        | 6.8 pF, $\pm 0.25$ pF; 50V             |
| C2331   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2332   | 2113740F47        | 68 pF, $\pm 5\%$ ; 50V                 |
| C2333 thru 2335   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2336   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2337   | 2113740G29        | 10 pF, $\pm 0.1$ pF; 50V               |
| C2338   | 2113740G33        | 15 pF, $\pm 2\%$ ; 50 V                |
| C2400 thru 2402   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2403   | 2113740F21        | 5.6 pF, $\pm 0.25$ pF; 50V             |
| C2404   | 2113740F19        | 4.7 pF, $\pm 0.25$ pF; 50V             |
| C2405   | 2113740F33        | 18 pF, $\pm 5\%$ ; 50V                 |
| C2406   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C2407   | 2113740F19        | 4.7 pF, $\pm 0.25$ pF; 50V             |
| C2408   | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V             |
| C2409   | 2113740F27        | 10 pF, $\pm 5\%$ ; 50V                 |
| C2410   | 2113740L02        | CAP CER CHIP 2.2 pF $\pm 0.1$ pF       |
| C2411   | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V             |
| C2412   | 2113740F27        | 10 pF, $\pm 5\%$ ; 50V                 |
| C2413,2414  | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V             |
| C2416   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2500,2501  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2502   | 2113741A57        | 0.033 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C2503 thru 2505   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2506   | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2507,2508  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2509   | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C2510   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2511   | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2512   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C2513   | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2514   | 2113740F21        | 5.6 pF, $\pm 0.25$ pF; 50V             |
| C2515   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2516   | 2113741A53        | 0.022 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C2517   | 2113740F15        | 3.3 pF, $\pm 0.25$ pF; 50V             |
| C2518 thru 2520   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |

## TRD6411C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL         | MOTOROLA PART NO. | DESCRIPTION                            |
|--------------------------|-------------------|--|
| C2521                    | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2522                    | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2523                    | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2524                    | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2525                    | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2526 thru 2528          | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2529                    | 2113740L02        | CAP CER CHIP 2.2 pF $\pm 0.1$ pF       |
| C2530                    | 2113740G37        | 22 pF, $\pm 2$ pF; 50V                 |
| C2532                    | 2113741F37        | 3300 pF, $\pm 5\%$ ; 50V               |
| C2533                    | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C2534                    | 2113740G37        | 22 pF, $\pm 2$ pF; 50V                 |
| C2535                    | 2113740F43        | 47 pF, $\pm 5\%$ ; 50V                 |
| C2536                    | 2311049A10        | 2.2 $\mu\text{F}$ , $\pm 10\%$ ; 35 V  |
| C2537                    | 2113740G37        | 22 pF, $\pm 2$ pF; 50V                 |
| C2538                    | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2540                    | 2113741A05        | 220 pF, $\pm 5\%$ ; 50V                |
| C2600                    | 2113740F37        | 27 pF, $\pm 5\%$ ; 50V                 |
| C2601                    | 2113740F28        | 11 pF, $\pm 5\%$ ; 50V                 |
| C2610,2611               | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2612 thru 2619          | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2620                    | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2621                    | 2113740G41        | 33 pF, $\pm 1\%$ ; 50V                 |
| C2622 thru 2624          | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2625                    | 2113740F35        | 22 pF, $\pm 5\%$ ; 50V                 |
| C2700,2701               | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2702                    | 2113901A45        | CAP CHIP HI Q 33 pF $\pm 5\%$          |
| C2703                    | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2704                    | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2705                    | 2113901A50        | CAP CHIP HI Q 47 pF $\pm 5\%$          |
| C2706                    | 2113740A12        | 2.4 pF, $\pm 0.25$ pF; 50V             |
| C2707,2708               | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2709                    | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2710                    | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2711                    | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2712                    | 0882422W28        | CAP FILM SM 0.022 $\mu\text{F}$ 63V 5% |
| C2713                    | 2113740G11        | 2.2 pF, $\pm 0.1$ pF; 50 V             |
| C2714                    | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2715                    | 2113901A38        | CAP CHIP HI Q 22 pF $\pm 5\%$          |
| C2716                    | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2717                    | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2718                    | 2113901A41        | CAP CHIP HI Q 27 pF $\pm 5\%$          |
| C2719                    | 2113740A12        | 2.4 pF, $\pm 0.25$ pF; 50V             |
| C2720,2721               | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2722                    | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2723                    | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2724,2725               | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2726                    | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C2727                    | 2311049A23        | 47 $\mu\text{F}$ , $\pm 10\%$ ; 10 V   |
| C2728,2729               | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C2730                    | 2113901A06        | CAP CHIP HI Q 1.5 pF $\pm 0.25$ pF     |
| C2732                    | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2800                    | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2801                    | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C2802                    | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2803,2804               | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2805                    | 2113740A43        | 39 pF, $\pm 5\%$ ; 50 V                |
| C2806                    | 2113740A39        | 27 pF, $\pm 5\%$ ; 50 V                |
| C2807                    | 0882422W28        | CAP FILM SM 0.022 $\mu\text{F}$ 63V 5% |
| C2808                    | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2809                    | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2810                    | 0882422W31        | CAP FILM SM 0.22 $\mu\text{F}$ 63V 5%  |
| C2811                    | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2812,2813               | 0882422W45        | CAP FILM SM 1.0 $\mu\text{F}$ 63V 5%   |
| C2814 thru 2816          | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2817                    | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2818,2819               | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2820                    | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2822,2823               | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2825                    | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C2847                    | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| <b>DIODE: (SEE NOTE)</b> |                   |  |
| D2330,2331               | 4882290T04        | Diode; hot carrier                     |
| D2500 thru 2502          | 4813825A01        | 3V, dual                               |
| D2700                    | 4813825A06        | Pin,35 V                               |
| D2701                    | 4882290T01        | Schottky type                          |
| D2702 thru 2704          | 4813825A01        | 3V, dual                               |
| D2705                    | 4813825A06        | Pin,35 V                               |
| D2706                    | 4882290T01        | Schottky type                          |
| D2707 thru 2709          | 4813825A01        | 3V, dual                               |
| D2800,2801               | 4813833C10        | 0.1A, 70 V                             |

68P81094E11-D

Parts List (Sheet 21 of 27)

12/26/01

TRD6411C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION   |
|------------------|-------------------|---|
| D2802            | 4882290T01        | Schottky type   |
| J2001            | 0982492W01        | <b>CONNECTOR, RECEPTACLE:</b><br>BNC CONN PCB VERTICAL RECEPT |
| L2000            | 2484657R01        | <b>COIL, INDUCTOR:</b><br>ferrite bead                        |
| L2001,2002       | 2411087A23        | 0.56 μH   |
| L2050            | 2462587N71        | 1800 nH, ±5%  |
| L2200            | 2462587X50        | IND CHIP LO-PRO 56.0 nH 5%                                    |
| L2201            | 2411087A26        | 1.0 μH  |
| L2202 thru 2204  | 2460591W04        | COIL SQUARE RFD-022-16  |
| L2260            | 2411087A36        | COIL CHIP 6.8 μH 10 A/P                                       |
| L2261            | 2462587N71        | 1800 nH, ±5%  |
| L2262            | 2462587X47        | IND CHIP LO-PRO 33.0 nH 5%                                    |
| L2263,2264       | 2462587X48        | IND CHIP LO-PRO 39.0 nH 5%                                    |
| L2300,2301       | 2462587T16        | IND CHIP 120nH 5% LOW PRO                                     |
| L2302            | 2462587X47        | IND CHIP LO-PRO 33.0 nH 5%                                    |
| L2303,2304       | 2462587T16        | IND CHIP 120nH 5% LOW PRO                                     |
| L2330,2331       | 2584600T01        | Balun; RF   |
| L2332,2333       | 2462587X57        | CHIP IND lopro 220 nH 5%                                      |
| L2334            | 2462587N71        | 1800 nH, ±5%  |
| L2335            | 2462587X45        | IND CHIP LO-PRO 22.0 nH 5%                                    |
| L2400            | 2462587N71        | 1800 nH, ±5%  |
| L2401            | 2462587X61        | IND CHIP LO-PRO 470 nH 5%                                     |
| L2402            | 2462587N69        | 1200 nH, 5%   |
| L2403            | 2462587X67        | IND CHIP LO-PRO 910 nH 5%                                     |
| L2404,2405       | 2462587X59        | IND CHIP LO-PRO 330 nH 5%                                     |
| L2406            | 2462587X67        | IND CHIP LO-PRO 910 nH 5%                                     |
| L2407,2408       | 2462587N72        | 2200 nH, ±5%  |
| L2500,2501       | 9185128U02        | FLTR L-C 450KC LCF- 450                                       |
| L2502,2503       | 2462587X57        | CHIP IND lopro 220 nH 5%                                      |
| L2504            | 2462587N71        | 1800 nH, ±5%  |
| L2505            | 2462587N72        | 2200 nH, ±5%  |
| L2506            | 2462587X61        | IND CHIP LO-PRO 470 nH 5%                                     |
| L2507            | 2462587N72        | 2200 nH, ±5%  |
| L2600,2601       | 2462587X48        | IND CHIP LO-PRO 39.0 nH 5%                                    |
| L2610 thru 2612  | 2462587N71        | 1800 nH, ±5%  |
| L2613            | 2484657R01        | ferrite bead  |
| L2614            | 2462587X49        | IND CHIP LO-PRO 47.0 nH 5%                                    |
| L2700,2701       | 2462587N71        | 1800 nH, ±5%  |
| L2702            | 2462587X54        | IND CHIP LO-PRO 120 nH 5%                                     |
| L2703,2704       | 2462587N71        | 1800 nH, ±5%  |
| L2705            | 2462587X51        | IND CHIP LO-PRO 68.0 nH 5%                                    |
| L2707            | 2462587N71        | 1800 nH, ±5%  |
| L2708            | 2462587X54        | IND CHIP LO-PRO 120 nH 5%                                     |
| L2709,2710       | 2462587N71        | 1800 nH, ±5%  |
| L2711,2712       | 0105950T44        | COIL HELICL MOLDED FIN .175 SQ                                |
| L2800            | 2462587N71        | 1800 nH, ±5%  |
| L2801            | 2462587X57        | CHIP IND lopro 220 nH 5%                                      |
| L2802            | 2411087A54        | 220 μH, ±10%  |
| L2803            | 2462587N71        | 1800 nH, ±5%  |
| P2001            | 2882982X01        | <b>CONNECTOR, PLUG:</b><br>HDR 2 X 14 VERT                    |
| Q2260            | 4813824A17        | <b>TRANSISTOR: (SEE NOTE)</b><br>PNP                          |
| Q2261            | 4813827A24        | TSTR NPN SML SIG MRF5812 5812                                 |
| Q2400            | 4885228U05        | TSTR GAAS DL GATE MESFET_U73_                                 |
| Q2502 thru 2505  | 4813824A10        | NPN   |
| Q2506            | 4813823A06        | Transistor; J-FET   |
| Q2610            | 4813824A17        | PNP   |
| Q2611,2612       | 4813827A26        | Transistor; NPN   |
| Q2700,2701       | 4813824A17        | PNP   |
| Q2702            | 4813823A06        | Transistor; J-FET   |
| Q2703            | 4813827A03        | NPN   |
| Q2704 thru 2706  | 4813824A10        | NPN   |
| Q2707            | 4813823A06        | Transistor; J-FET   |
| Q2708            | 4813827A03        | NPN   |
| Q2800            | 4813824A10        | NPN   |
| Q2801            | 4813824A17        | PNP   |
| Q2802,2803       | 4813824A10        | NPN   |
| Q2804            | 4813824A17        | PNP   |
| Q2805            | 4813827A03        | NPN   |
| Q2806 thru 2809  | 4813824A10        | NPN   |
| Q2810            | 4813824A17        | PNP   |
| Q2811            | 4813824A10        | NPN   |

TRD6411C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION  |
|------------------|-------------------|--|
| R2001            | 0662057B47        | <b>RESISTOR, FIXED: ±5%; 1/4 W:</b><br>UNLESS OTHERWISE STATED |
| R2050,2051       | 0662057A69        | Chip Res 0 Ohms ±.050 Ohms                                     |
| R2052            | 0662057A73        | Chip Res 6800 Ohms   |
| R2053            | 0662057A61        | Chip Res 10K Ohms  |
| R2054            | 0662057A59        | Chip Res 3300 Ohms   |
| R2055            | 0662057A79        | Chip Res 2700 Ohms   |
| R2056            | 0662057A51        | Chip Res 18K Ohms  |
| R2057            | 0662057A61        | Chip Res 1200 Ohms   |
| R2058            | 0662057A71        | Chip Res 3300 Ohms   |
| R2236,2237       | 0611079A01        | Chip Res 8200 Ohms   |
| R2260            | 0662057A67        | O Ohms, ±5%; 1/10 W  |
| R2261            | 0662057A59        | Chip Res 5600 Ohms   |
| R2262            | 0683962T37        | Chip Res 2700 Ohms   |
| R2263,2264       | 0662057A65        | 33 Ohms, ±5%; 1W   |
| R2265            | 0662057A49        | Chip Res 4700 Ohms   |
| R2266            | 0611072A09        | Chip Res 1000 Ohms   |
| R2267            | 0662057A35        | 22 Ohms, ±5%; 1/4 W  |
| R2269            | 0662057A01        | Chip Res 270 Ohms  |
| R2270            | 0662057A41        | Chip Res 10 Ohms   |
| R2271 thru 2274  | 0662057A01        | Chip Res 470 Ohms  |
| R2330            | 0662057B47        | Chip Res 10 Ohms   |
| R2333,2334       | 0662057A21        | Chip Res 0 Ohms ±.050 Ohms                                     |
| R2335            | 0662057A17        | Chip Res 68 Ohms   |
| R2336,2337       | 0662057A21        | Chip Res 47 Ohms   |
| R2338            | 0662057A61        | Chip Res 68 Ohms   |
| R2339            | 0662057A49        | Chip Res 3300 Ohms   |
| R2340            | 0662057A73        | Chip Res 1000 Ohms   |
| R2400            | 0662057A33        | Chip Res 10K Ohms  |
| R2401            | 0662057A57        | Chip Res 220 Ohms  |
| R2402            | 0662057A49        | Chip Res 2200 Ohms   |
| R2403            | 0662057A25        | Chip Res 1000 Ohms   |
| R2404            | 0662057A41        | Chip Res 100 Ohms  |
| R2407            | 0662057A33        | Chip Res 470 Ohms  |
| R2408            | 0662057A59        | Chip Res 220 Ohms  |
| R2409            | 0662057A21        | Chip Res 2700 Ohms   |
| R2410            | 0662057A73        | Chip Res 68 Ohms   |
| R2411            | 0662057A65        | Chip Res 10K Ohms  |
| R2412            | 0662057A73        | Chip Res 4700 Ohms   |
| R2415            | 0662057A01        | Chip Res 10K Ohms  |
| R2500            | 0662057A11        | Chip Res 27 Ohms   |
| R2501            | 0611079A21        | 6.2 Ohms, ±5%; 1/10 W  |
| R2502            | 0662057B08        | Chip Res 270K Ohms   |
| R2503            | 0662057A13        | Chip Res 33 Ohms   |
| R2504            | 0662057A73        | Chip Res 10K Ohms  |
| R2505            | 0662057A85        | Chip Res 33K Ohms  |
| R2506            | 0662057A69        | Chip Res 6800 Ohms   |
| R2507            | 0662057B47        | Chip Res 0 Ohms ±.050 Ohms                                     |
| R2508            | 0662057A21        | Chip Res 68 Ohms   |
| R2509            | 0662057A17        | Chip Res 27K Ohms  |
| R2510            | 0662057A21        | Chip Res 47 Ohms   |
| R2511            | 0662057A11        | Chip Res 68 Ohms   |
| R2512            | 0662057A57        | Chip Res 27 Ohms   |
| R2513,2514       | 0662057A21        | Chip Res 2200 Ohms   |
| R2515            | 0662057A11        | Chip Res 68 Ohms   |
| R2518            | 0662057A17        | Chip Res 27 Ohms   |
| R2519,2520       | 0662057A73        | Chip Res 47 Ohms   |
| R2521            | 0662057A83        | Chip Res 10K Ohms  |
| R2522,2523       | 0662057A37        | Chip Res 27K Ohms  |
| R2524            | 0680149M01        | Chip Res 330 Ohms  |
| R2525            | 0662057A37        | 470 Ohms, ±10%; 240 mW   |
| R2526            | 0662057A31        | Chip Res 330 Ohms  |
| R2527,2528       | 0662057A09        | Chip Res 180 Ohms  |
| R2529            | 0662057A83        | Chip Res 22 Ohms   |
| R2600            | 0611079A26        | Chip Res 27K Ohms  |
| R2601,2602       | 0662057A41        | 10 Ohms, ±5%; 1/10 W   |
| R2610,2611       | 0611072A15        | Chip Res 470 Ohms  |
| R2612            | 0662057A45        | 39 Ohms, ±5%; 1/4W   |
| R2613            | 0662057A57        | Chip Res 680 Ohms  |
| R2614,2615       | 0662057A47        | Chip Res 2200 Ohms   |
| R2616            | 0662057A41        | Chip Res 820 Ohms  |
| R2617            | 0662057A33        | Chip Res 470 Ohms  |
| R2618            | 0611079A42        | Chip Res 220 Ohms  |
| R2619            | 0662057A33        | 47 Ohms, ±5%; 1/10 W   |
| R2620            | 0662057A11        | Chip Res 220 Ohms  |
| R2621            | 0662057A35        | Chip Res 27 Ohms   |
| R2622            | 0662057B47        | Chip Res 270 Ohms  |
| R2623            | 0662057A21        | Chip Res 0 Ohms ±.050 Ohms                                     |
| R2700            | 0662057A17        | Chip Res 68 Ohms   |
| R2701 thru 2703  | 0662057A41        | Chip Res 47 Ohms   |

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**TRD6411C Receiver Module (136 to 174 MHz)**

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                     |
|---------------------------------------|-------------------|---------------------------------|
| R2704                                 | 0662057A89        | Chip Res 47K Ohms               |
| R2705                                 | 0662057A29        | Chip Res 150 Ohms               |
| R2706                                 | 0662057A69        | Chip Res 6800 Ohms              |
| R2707,2708                            | 0662057A59        | Chip Res 2700 Ohms              |
| R2709                                 | 0680149M01        | 470 Ohms, $\pm 10\%$ ; 240 mW   |
| R2710                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2711                                 | 0662057A83        | Chip Res 27K Ohms               |
| R2712                                 | 0662057A37        | Chip Res 330 Ohms               |
| R2713                                 | 0662057A49        | Chip Res 1000 Ohms              |
| R2714                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2715                                 | 0662057A35        | Chip Res 270 Ohms               |
| R2716,2717                            | 0662057A59        | Chip Res 2700 Ohms              |
| R2718                                 | 0662057A17        | Chip Res 47 Ohms                |
| R2719                                 | 0662057A01        | Chip Res 10 Ohms                |
| R2720                                 | 0662057A29        | Chip Res 150 Ohms               |
| R2721                                 | 0662057A41        | Chip Res 470 Ohms               |
| R2722                                 | 0662057A89        | Chip Res 47K Ohms               |
| R2723                                 | 0662057B47        | Chip Res 0 Ohms $\pm .050$ Ohms |
| R2724                                 | 0662057A01        | Chip Res 10 Ohms                |
| R2725                                 | 0662057A35        | Chip Res 270 Ohms               |
| R2726                                 | 0680149M01        | 470 Ohms, $\pm 10\%$ ; 240 mW   |
| R2727                                 | 0662057A01        | Chip Res 10 Ohms                |
| R2728                                 | 0662057A83        | Chip Res 27K Ohms               |
| R2729                                 | 0662057A37        | Chip Res 330 Ohms               |
| R2730                                 | 0662057A49        | Chip Res 1000 Ohms              |
| R2731                                 | 0662057A35        | Chip Res 270 Ohms               |
| R2800                                 | 0662057A67        | Chip Res 5600 Ohms              |
| R2801,2802                            | 0662057A73        | Chip Res 10K Ohms               |
| R2803                                 | 0662057A41        | Chip Res 470 Ohms               |
| R2804                                 | 0662057A37        | Chip Res 330 Ohms               |
| R2805                                 | 0662057A61        | Chip Res 3300 Ohms              |
| R2806                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2807                                 | 0662057A59        | Chip Res 2700 Ohms              |
| R2808                                 | 0662057B47        | Chip Res 0 Ohms $\pm .050$ Ohms |
| R2809,2810                            | 0662057A49        | Chip Res 1000 Ohms              |
| R2811                                 | 0662057A61        | Chip Res 3300 Ohms              |
| R2812                                 | 0662057A09        | Chip Res 22 Ohms                |
| R2813                                 | 0662057A61        | Chip Res 3300 Ohms              |
| R2814                                 | 0662057A57        | Chip Res 2200 Ohms              |
| R2815                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2816,2817                            | 0662057A67        | Chip Res 5600 Ohms              |
| R2818                                 | 0662057A21        | Chip Res 68 Ohms                |
| R2819                                 | 0662057A61        | Chip Res 3300 Ohms              |
| R2820                                 | 0662057A49        | Chip Res 1000 Ohms              |
| R2821                                 | 0662057A09        | Chip Res 22 Ohms                |
| R2822                                 | 0662057A71        | Chip Res 8200 Ohms              |
| R2823                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2824                                 | 0662057A39        | Chip Res 390 Ohms               |
| R2825                                 | 0662057A65        | Chip Res 4700 Ohms              |
| R2826                                 | 0662057A57        | Chip Res 2200 Ohms              |
| R2827                                 | 0662057A37        | Chip Res 330 Ohms               |
| R2828                                 | 0662057A61        | Chip Res 3300 Ohms              |
| R2829                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2830                                 | 0662057A49        | Chip Res 1000 Ohms              |
| R2831                                 | 0662057A57        | Chip Res 2200 Ohms              |
| R2832                                 | 0662057A25        | Chip Res 100 Ohms               |
| R2833                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2834                                 | 0662057A67        | Chip Res 5600 Ohms              |
| R2835                                 | 0662057A25        | Chip Res 100 Ohms               |
| R2836                                 | 0662057A73        | Chip Res 10K Ohms               |
| R2837                                 | 0662057A61        | Chip Res 3300 Ohms              |
| R2838                                 | 0662057A89        | Chip Res 47K Ohms               |
| R2839                                 | 0662057A47        | Chip Res 820 Ohms               |
| R2840,2841                            | 0662057A73        | Chip Res 10K Ohms               |
| R2842                                 | 0662057A89        | Chip Res 47K Ohms               |
| R2843                                 | 0662057A67        | Chip Res 5600 Ohms              |
| R2869,2870                            | 0662057A97        | Chip Res 100K Ohms              |
| R2875                                 | 0662057A11        | Chip Res 27 Ohms                |
| <b>SHIELD:</b>                        |                   |                                 |
| SH2220                                | 1583004X02        | Corral Large                    |
| SH2330                                | 1583004X02        | Corral Large                    |
| SH2400                                | 1583004X02        | Corral Large                    |
| SH2610                                | 1583004X01        | Corral Large                    |
| SH2700,2701                           | 2682680X01        | Shield VCO                      |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |                                 |
| U2050                                 | 5182374Y01        | IC A/D 8 BIT                    |
| U2103,2104                            | 5113816A07        | 5-Volt Positive Regulator       |
| U2500                                 | 5184523T08        | IC ABACUS JEDEZ 52QFP           |
| U2501                                 | 5113805A08        | Triple 3-Input AND Gate         |

**TRD6411C Receiver Module (136 to 174 MHz)**

| REFERENCE SYMBOL            | MOTOROLA PART NO. | DESCRIPTION                          |
|-----------------------------|-------------------|--------------------------------------|
| U2502                       | 5113819A08        | Low Power                            |
| U2800                       | 5184602T03        | IC                                   |
| U2801                       | 5113819A08        | Low Power                            |
| U2802                       | 5113806A21        | Quad Analog Switch Multiplexer       |
| U2810                       | 5113805A18        | Dual D-Type Flip-Flop with Set/Reset |
| <b>CRYSTAL: (SEE NOTE)</b>  |                   |                                      |
| Y2400                       | 4805846W05        | XTAL FLTR 44.85M IM W CLIP           |
| Y2401,2402                  | 4805846W07        | XTAL FLTR 44.85M W CLIP              |
| <b>NON-REFERENCED ITEMS</b> |                   |                                      |
|                             | 5482006W01        | Label, PCB barcode                   |
|                             | 5482006W02        | ribbon, thermal transfer             |
|                             | 5484960T02        | Label Blank Barcode                  |

**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

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# Parts List

## TRD6431C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL                  | MOTOROLA PART NO. | DESCRIPTION  |
|-----------------------------------|-------------------|--|
| TRD6431A RECEIVER VHF R1 W/PRESEL |                   |  |
|                                   |                   | <b>CAPACITOR, FIXED: <math>\mu\text{F} \pm 10\%</math>; 100 V:</b> |
|                                   |                   | UNLESS OTHERWISE STATED  |
| C2000,2001                        | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2002                             | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V  |
| C2003,2004                        | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2005                             | 2113740F43        | 47 pF, $\pm 5\%$ ; 50V   |
| C2006 thru 2008                   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2010 thru 2016                   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2017                             | 2113741F17        | 470 pF, $\pm 5\%$ ; 50V  |
| C2018                             | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2019                             | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V  |
| C2050 thru 2055                   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2100,2101                        | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V                               |
| C2102                             | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V                               |
| C2103                             | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2109                             | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V                               |
| C2110                             | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V                               |
| C2111                             | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V                               |
| C2113                             | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V                               |
| C2114                             | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V                               |
| C2200                             | 2113740F45        | 56 pF, $\pm 5\%$ ; 50V   |
| C2202                             | 2113740F29        | 12 pF, $\pm 5\%$ ; 50V   |
| C2204                             | 2113740F41        | 39 pF, $\pm 5\%$ ; 50V   |
| C2205                             | 2113740F33        | 18 pF, $\pm 5\%$ ; 50V   |
| C2208                             | 2113740F41        | 39 pF, $\pm 5\%$ ; 50V   |
| C2220                             | 2113740F19        | 4.7 pF, $\pm 0.25$ pF; 50V   |
| C2221                             | 2113740F23        | 6.8 pF, $\pm 0.25$ pF; 50V   |
| C2222,2223                        | 2113740F49        | 82 pF, $\pm 5\%$ ; 50V   |
| C2225                             | 2113741A05        | 220 pF, $\pm 5\%$ ; 50V  |
| C2227                             | 2113741A05        | 220 pF, $\pm 5\%$ ; 50V  |
| C2228,2229                        | 2113741F01        | 100 pF, $\pm 5\%$ ; 50V  |
| C2230                             | 2113741A17        | 680 pF, $\pm 5\%$ ; 50V  |
| C2231                             | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V                                |
| C2232                             | 2113740F49        | 82 pF, $\pm 5\%$ ; 50V   |
| C2235                             | 2113740F49        | 82 pF, $\pm 5\%$ ; 50V   |
| C2260                             | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2261 thru 2263                   | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V                              |
| C2264,2265                        | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2266                             | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V                              |
| C2267                             | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2268                             | 2113740F29        | 12 pF, $\pm 5\%$ ; 50V   |
| C2269,2270                        | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2271                             | 2113740F33        | 18 pF, $\pm 5\%$ ; 50V   |
| C2300                             | 2113740G35        | 18 pF, $\pm 2\%$ ; 50V   |
| C2301                             | 2113740G18        | 4.3 pF, $\pm 0.1$ pF; 50V  |
| C2302                             | 2113740G21        | 5.6 pF, $\pm 0.1$ pF; 50V  |
| C2303                             | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2304                             | 2113740G18        | 4.3 pF, $\pm 0.1$ pF; 50V  |
| C2305                             | 2113740G15        | 3.3 pF, $\pm 0.1$ pF; 50 V   |
| C2306                             | 2113740A23        | 6.2 pF, $\pm 0.25$ pF; 50V   |
| C2308                             | 2113740G41        | 33 pF, $\pm 1\%$ ; 50V   |
| C2309                             | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V   |
| C2310                             | 2113740G20        | 5.1 pF, $\pm 0.1$ pF; 50V  |
| C2311                             | 2113740G25        | 7.5 pF, $\pm 0.1$ pF; 50V  |
| C2312                             | 2113740A44        | 43 pF, $\pm 5\%$ ; 50V   |
| C2330                             | 2113740F23        | 6.8 pF, $\pm 0.25$ pF; 50V   |
| C2331                             | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2332                             | 2113740F47        | 68 pF, $\pm 5\%$ ; 50V   |
| C2333 thru 2335                   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2336                             | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V   |
| C2337                             | 2113740G29        | 10 pF, $\pm 0.1$ pF; 50V   |
| C2338                             | 2113740G33        | 15 pF, $\pm 2\%$ ; 50 V  |
| C2400 thru 2402                   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2403                             | 2113740F21        | 5.6 pF, $\pm 0.25$ pF; 50V   |
| C2404                             | 2113740F19        | 4.7 pF, $\pm 0.25$ pF; 50V   |
| C2405                             | 2113740F33        | 18 pF, $\pm 5\%$ ; 50V   |
| C2406                             | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V  |
| C2407                             | 2113740F19        | 4.7 pF, $\pm 0.25$ pF; 50V   |
| C2408                             | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V   |
| C2409                             | 2113740F27        | 10 pF, $\pm 5\%$ ; 50V   |
| C2410                             | 2113740L02        | CAP CER CHIP 2.2 pF $\pm 0.1$ pF                                   |
| C2411                             | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V   |
| C2412                             | 2113740F27        | 10 pF, $\pm 5\%$ ; 50V   |
| C2413,2414                        | 2113740F25        | 8.2 pF, $\pm 0.25$ pF; 50V   |
| C2416                             | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2500,2501                        | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2502                             | 2113741A57        | 0.033 $\mu\text{F}$ , $\pm 5\%$ ; 50 V                             |
| C2503 thru 2505                   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |
| C2506                             | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V                                |
| C2507,2508                        | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V                               |

## TRD6431C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                            |
|------------------|-------------------|--|
| C2509            | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C2510            | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2511            | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2512            | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C2513            | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2514            | 2113740F21        | 5.6 pF, $\pm 0.25$ pF; 50V             |
| C2515            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2516            | 2113741A53        | 0.022 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C2517            | 2113740F15        | 3.3 pF, $\pm 0.25$ pF; 50V             |
| C2518 thru 2520  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2521            | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2522            | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2523            | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2524            | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2525            | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2526 thru 2528  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C2529            | 2113740L02        | CAP CER CHIP 2.2 pF $\pm 0.1$ pF       |
| C2530            | 2113740G37        | 22 pF, $\pm 2$ pF; 50V                 |
| C2532            | 2113741F37        | 3300 pF, $\pm 5\%$ ; 50V               |
| C2533            | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C2534            | 2113740G37        | 22 pF, $\pm 2$ pF; 50V                 |
| C2535            | 2113740F43        | 47 pF, $\pm 5\%$ ; 50V                 |
| C2536            | 2311049A10        | 2.2 $\mu\text{F}$ , $\pm 10\%$ ; 35 V  |
| C2537            | 2113740G37        | 22 pF, $\pm 2$ pF; 50V                 |
| C2538            | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2540            | 2113741A05        | 220 pF, $\pm 5\%$ ; 50V                |
| C2600            | 2113740F37        | 27 pF, $\pm 5\%$ ; 50V                 |
| C2601            | 2113740F28        | 11 pF, $\pm 5\%$ ; 50V                 |
| C2610,2611       | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2612 thru 2619  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2620            | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C2621            | 2113740G41        | 33 pF, $\pm 1\%$ ; 50V                 |
| C2622 thru 2624  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2625            | 2113740F35        | 22 pF, $\pm 5\%$ ; 50V                 |
| C2700,2701       | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2702            | 2113901A45        | CAP CHIP HI Q 33 pF $\pm 5\%$          |
| C2703            | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2704            | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2705            | 2113901A50        | CAP CHIP HI Q 47 pF $\pm 5\%$          |
| C2706            | 2113740A12        | 2.4 pF, $\pm 0.25$ pF; 50V             |
| C2707,2708       | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2709            | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2710            | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2711            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2712            | 0882422W28        | CAP FILM SM 0.022 $\mu\text{F}$ 63V 5% |
| C2713            | 2113740G11        | 2.2 pF, $\pm 0.1$ pF; 50 V             |
| C2714            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2715            | 2113901A38        | CAP CHIP HI Q 22 pF $\pm 5\%$          |
| C2716            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2717            | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2718            | 2113901A41        | CAP CHIP HI Q 27 pF $\pm 5\%$          |
| C2719            | 2113740A12        | 2.4 pF, $\pm 0.25$ pF; 50V             |
| C2720,2721       | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2722            | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C2723            | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C2724,2725       | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2726            | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C2727            | 2311049A23        | 47 $\mu\text{F}$ , $\pm 10\%$ ; 10 V   |
| C2728,2729       | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C2730            | 2113901A06        | CAP CHIP HI Q 1.5 pF $\pm 0.25$ pF     |
| C2732            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2800            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2801            | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C2802            | 2311049A18        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C2803,2804       | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2805            | 2113740A43        | 39 pF, $\pm 5\%$ ; 50 V                |
| C2806            | 2113740A39        | 27 pF, $\pm 5\%$ ; 50 V                |
| C2807            | 0882422W28        | CAP FILM SM 0.022 $\mu\text{F}$ 63V 5% |
| C2808            | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C2809            | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2810            | 0882422W31        | CAP FILM SM 0.22 $\mu\text{F}$ 63V 5%  |
| C2811            | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2812,2813       | 0882422W45        | CAP FILM SM 1.0 $\mu\text{F}$ 63V 5%   |
| C2814 thru 2816  | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2817            | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2818,2819       | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C2820            | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2822,2823       | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C2825            | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C2847            | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |

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TRD6431C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION   |
|------------------|-------------------|---|
| D2220 thru 2223  | 4813825A01        | <b>DIODE: (SEE NOTE)</b><br>3V, dual<br>dual 70 V<br>Diode; hot carrier<br>3V, dual<br>Pin,35 V<br>Schottky type<br>3V, dual<br>Pin,35 V<br>Schottky type<br>3V, dual<br>0.1A, 70 V<br>Schottky type  |
| D2224            | 4813833C05        |   |
| D2330,2331       | 4882290T04        |   |
| D2500 thru 2502  | 4813825A01        |   |
| D2700            | 4813825A06        |   |
| D2701            | 4882290T01        |   |
| D2702 thru 2704  | 4813825A01        |   |
| D2705            | 4813825A06        |   |
| D2706            | 4882290T01        |   |
| D2707 thru 2709  | 4813825A01        |   |
| D2800,2801       | 4813833C10        |   |
| D2802            | 4882290T01        |   |
| J2001            | 0982492W01        | <b>CONNECTOR, RECEPACLE:</b><br>BNC CONN PCB VERTICAL RECEPT  |
| L2000            | 2484657R01        |   |
| L2001,2002       | 2411087A23        | <b>COIL, INDUCTOR:</b><br>ferrite bead<br>0.56 µH<br>1800 nH, ±5%<br>IND CHIP LO-PRO 56.0 nH 5%<br>1.0 µH<br>COIL SQUARE RFD-022-16<br>COIL AIR WOUND SQUARE 21 nH<br>COIL SM AIR WOUND<br>COIL CHIP 6.8 µH 10 A/P<br>1800 nH, ±5%<br>IND CHIP LO-PRO 33.0 nH 5%<br>IND CHIP LO-PRO 39.0 nH 5%<br>IND CHIP 120nH 5% LOW PRO<br>IND CHIP LO-PRO 33.0 nH 5%<br>IND CHIP 120nH 5% LOW PRO<br>Balun; RF<br>CHIP IND lopro 220 nH 5%<br>1800 nH, ±5%<br>IND CHIP LO-PRO 22.0 nH 5%<br>1800 nH, ±5%<br>IND CHIP LO-PRO 470 nH 5%<br>1200 nH, 5%<br>IND CHIP LO-PRO 910 nH 5%<br>IND CHIP LO-PRO 330 nH 5%<br>IND CHIP LO-PRO 910 nH 5%<br>2200 nH, ±5%<br>FLTR L-C 450KC LCF- 450<br>CHIP IND lopro 220 nH 5%<br>1800 nH, ±5%<br>2200 nH, ±5%<br>IND CHIP LO-PRO 470 nH 5%<br>2200 nH, ±5%<br>IND CHIP LO-PRO 39.0 nH 5%<br>1800 nH, ±5%<br>ferrite bead<br>IND CHIP LO-PRO 47.0 nH 5%<br>1800 nH, ±5%<br>IND CHIP LO-PRO 120 nH 5%<br>1800 nH, ±5%<br>IND CHIP LO-PRO 68.0 nH 5%<br>1800 nH, ±5%<br>IND CHIP LO-PRO 120 nH 5%<br>1800 nH, ±5%<br>COIL HELICL MOLDED FIN .175 SQ<br>1800 nH, ±5%<br>CHIP IND lopro 220 nH 5%<br>220 µH, ±10%<br>1800 nH, ±5%  |
| L2050            | 2462587N71        |   |
| L2200            | 2462587X50        |   |
| L2201            | 2411087A26        |   |
| L2202 thru 2204  | 2460591W04        |   |
| L2220,2221       | 2460591X01        |   |
| L2222,2223       | 2483070X01        |   |
| L2260            | 2411087A36        |   |
| L2261            | 2462587N71        |   |
| L2262            | 2462587X47        |   |
| L2263,2264       | 2462587X48        |   |
| L2300,2301       | 2462587T16        |   |
| L2302            | 2462587X47        |   |
| L2303,2304       | 2462587T16        |   |
| L2330,2331       | 2584600T01        |   |
| L2332,2333       | 2462587X57        |   |
| L2334            | 2462587N71        |   |
| L2335            | 2462587X45        |   |
| L2400            | 2462587N71        |   |
| L2401            | 2462587X61        |   |
| L2402            | 2462587N69        |   |
| L2403            | 2462587X67        |   |
| L2404,2405       | 2462587X59        |   |
| L2406            | 2462587X67        |   |
| L2407,2408       | 2462587N72        |   |
| L2500,2501       | 9185128U02        |   |
| L2502,2503       | 2462587X57        |   |
| L2504            | 2462587N71        |   |
| L2505            | 2462587N72        |   |
| L2506            | 2462587X61        |   |
| L2507            | 2462587N72        |   |
| L2600,2601       | 2462587X48        |   |
| L2610 thru 2612  | 2462587N71        |   |
| L2613            | 2484657R01        |   |
| L2614            | 2462587X49        |   |
| L2700,2701       | 2462587N71        |   |
| L2702            | 2462587X54        |   |
| L2703,2704       | 2462587N71        |   |
| L2705            | 2462587X51        |   |
| L2707            | 2462587N71        |   |
| L2708            | 2462587X54        |   |
| L2709,2710       | 2462587N71        |   |
| L2711,2712       | 0105950T44        |   |
| L2800            | 2462587N71        |   |
| L2801            | 2462587X57        |   |
| L2802            | 2411087A54        |   |
| L2803            | 2462587N71        |   |
| P2001            | 2882982X01        | <b>CONNECTOR, PLUG:</b><br>HDR 2 X 14 VERT  |
| Q2260            | 4813824A17        |   |
| Q2261            | 4813827A24        | <b>TRANSISTOR: (SEE NOTE)</b><br>PNP<br>TSTR NPN SML SIG MRF5812 5812<br>TSTR GAAS DL GATE MESFET_U73_<br>NPN<br>Transistor; J-FET<br>PNP<br>Transistor; NPN<br>PNP<br>Transistor; J-FET<br>NPN   |
| Q2400            | 4885228U05        |   |
| Q2502 thru 2505  | 4813824A10        |   |
| Q2506            | 4813823A06        |   |
| Q2610            | 4813824A17        |   |
| Q2611,2612       | 4813827A26        |   |
| Q2700,2701       | 4813824A17        |   |
| Q2702            | 4813823A06        |   |
| Q2703            | 4813827A03        |   |
| Q2704 thru 2706  | 4813824A10        |   |
| Q2707            | 4813823A06        |   |
| Q2708            | 4813827A03        |   |
| Q2800            | 4813824A10        |   |
| Q2801            | 4813824A17        |   |
| Q2802,2803       | 4813824A10        |   |
| Q2804            | 4813824A17        |   |
| Q2805            | 4813827A03        |   |
| Q2806 thru 2809  | 4813824A10        |   |
| Q2810            | 4813824A17        |   |
| Q2811            | 4813824A10        |   |
| R2001            | 0662057B47        | <b>RESISTOR, FIXED: ±5%; 1/4 W:</b><br>UNLESS OTHERWISE STATED<br>Chip Res 0 Ohms ±.050 Ohms<br>Chip Res 6800 Ohms<br>Chip Res 10K Ohms<br>Chip Res 3300 Ohms<br>Chip Res 2700 Ohms<br>Chip Res 33K Ohms<br>Chip Res 1200 Ohms<br>Chip Res 5600 Ohms<br>Chip Res 33K Ohms<br>Chip Res 4700 Ohms<br>Chip Res 0 Ohms ±.050 Ohms<br>Chip Res 15K Ohms<br>Chip Res 10K Ohms<br>Chip Res 4700 Ohms<br>Chip Res 10K Ohms<br>Chip Res 2700 Ohms<br>Chip Res 3900 Ohms<br>Chip Res 1000 Ohms<br>Chip Res 3900 Ohms<br>Chip Res 100K Ohms<br>Chip Res 10K Ohms<br>Chip Res 470 Ohms<br>Chip Res 10 Ohms<br>Chip Res 5600 Ohms<br>Chip Res 2700 Ohms<br>33 Ohms, ±5%; 1W<br>Chip Res 4700 Ohms<br>Chip Res 1000 Ohms<br>22 Ohms, ±5%; 1/4 W<br>Chip Res 270 Ohms<br>Chip Res 10 Ohms<br>Chip Res 470 Ohms<br>Chip Res 10 Ohms<br>Chip Res 0 Ohms ±.050 Ohms<br>Chip Res 68 Ohms<br>Chip Res 47 Ohms<br>Chip Res 68 Ohms<br>Chip Res 3300 Ohms<br>Chip Res 1000 Ohms<br>Chip Res 10K Ohms<br>Chip Res 220 Ohms<br>Chip Res 2200 Ohms<br>Chip Res 1000 Ohms<br>Chip Res 100 Ohms<br>Chip Res 470 Ohms<br>Chip Res 220 Ohms<br>Chip Res 2700 Ohms<br>Chip Res 68 Ohms<br>Chip Res 10K Ohms<br>Chip Res 10K Ohms<br>Chip Res 10 Ohms<br>Chip Res 27 Ohms<br>6.2 Ohms, ±5%; 1/10 W<br>Chip Res 270K Ohms<br>Chip Res 33 Ohms<br>Chip Res 10K Ohms<br>Chip Res 33K Ohms<br>Chip Res 6800 Ohms<br>Chip Res 0 Ohms ±.050 Ohms<br>Chip Res 68 Ohms<br>Chip Res 47 Ohms<br>Chip Res 68 Ohms<br>Chip Res 27 Ohms<br>Chip Res 2200 Ohms<br>Chip Res 68 Ohms<br>Chip Res 27 Ohms |
| R2050,2051       | 0662057A69        |   |
| R2052            | 0662057A73        |   |
| R2053            | 0662057A61        |   |
| R2054            | 0662057A59        |   |
| R2055            | 0662057A85        |   |
| R2056            | 0662057A51        |   |
| R2057            | 0662057A67        |   |
| R2058            | 0662057A85        |   |
| R2222            | 0662057A65        |   |
| R2223            | 0662057B47        |   |
| R2224            | 0662057A77        |   |
| R2225            | 0662057A73        |   |
| R2226            | 0662057A65        |   |
| R2227,2228       | 0662057A73        |   |
| R2229            | 0662057A59        |   |
| R2230            | 0662057A63        |   |
| R2231            | 0662057A49        |   |
| R2232            | 0662057A63        |   |
| R2234,2235       | 0662057A97        |   |
| R2238            | 0662057A73        |   |
| R2240            | 0662057A41        |   |
| R2245,2246       | 0662057A01        |   |
| R2260            | 0662057A67        |   |
| R2261            | 0662057A59        |   |
| R2262            | 0683962T37        |   |
| R2263,2264       | 0662057A65        |   |
| R2265            | 0662057A49        |   |
| R2266            | 0611072A09        |   |
| R2267            | 0662057A35        |   |
| R2269            | 0662057A01        |   |
| R2270            | 0662057A41        |   |
| R2271 thru 2274  | 0662057A01        |   |
| R2330            | 0662057B47        |   |
| R2333,2334       | 0662057A21        |   |
| R2335            | 0662057A17        |   |
| R2336,2337       | 0662057A21        |   |
| R2338            | 0662057A61        |   |
| R2339            | 0662057A49        |   |
| R2340            | 0662057A73        |   |
| R2400            | 0662057A33        |   |
| R2401            | 0662057A57        |   |
| R2402            | 0662057A49        |   |
| R2403            | 0662057A25        |   |
| R2404            | 0662057A41        |   |
| R2407            | 0662057A33        |   |
| R2408            | 0662057A59        |   |
| R2409            | 0662057A21        |   |
| R2410            | 0662057A73        |   |
| R2411            | 0662057A65        |   |
| R2412            | 0662057A73        |   |
| R2415            | 0662057A01        |   |
| R2500            | 0662057A11        |   |
| R2501            | 0611079A21        |   |
| R2502            | 0662057B08        |   |
| R2503            | 0662057A13        |   |
| R2504            | 0662057A73        |   |
| R2505            | 0662057A85        |   |
| R2506            | 0662057A69        |   |
| R2507            | 0662057B47        |   |
| R2508            | 0662057A21        |   |
| R2509            | 0662057A17        |   |
| R2510            | 0662057A21        |   |
| R2511            | 0662057A11        |   |
| R2512            | 0662057A57        |   |
| R2513,2514       | 0662057A21        |   |
| R2515            | 0662057A11        |   |

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TRD6431C Receiver Module (136 to 174 MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION  |
|------------------|-------------------|--|
| Q2704 thru 2706  | 4813824A10        | NPN<br>Transistor; J-FET<br>NPN<br>NPN<br>PNP<br>NPN<br>PNP<br>NPN<br>NPN<br>PNP<br>PNP<br>NPN |
| Q2707            | 4813823A06        |  |
| Q2708            | 4813827A03        |  |
| Q2800            | 4813824A10        |  |
| Q2801            | 4813824A17        |  |
| Q2802,2803       | 4813824A10        |  |
| Q2804            | 4813824A17        |  |
| Q2805            | 4813827A03        |  |
| Q2806 thru 2809  | 4813824A10        |  |
| Q2810            | 4813824A17        |  |
| Q2811            | 4813824A10        |  |
| R2001            | 0662057B47        |  |
| R2050,2051       | 0662057A69        |  |
| R2052            | 0662057A73        |  |
| R2053            | 0662057A61        |  |
| R2054            | 0662057A59        |  |
| R2055            | 0662057A85        |  |
| R2056            | 0662057A51        |  |
| R2057            | 0662057A67        |  |
| R2058            | 0662057A85        |  |
| R2222            | 0662057A65        |  |
| R2223            | 0662057B47        |  |
| R2224            | 0662057A77        |  |
| R2225            | 0662057A73        |  |
| R2226            | 0662057A65        |  |
| R2227,2228       | 0662057A73        |  |
| R2229            | 0662057A59        |  |
| R2230            | 0662057A63        |  |
| R2231            | 0662057A49        |  |
| R2232            | 0662057A63        |  |
| R2234,2235       | 0662057A97        |  |
| R2238            | 0662057A73        |  |
| R2240            | 0662057A41        |  |
| R2245,2246       | 0662057A01        |  |
| R2260            | 0662057A67        |  |
| R2261            | 0662057A59        |  |
| R2262            | 0683962T37        |  |
| R2263,2264       | 0662057A65        |  |
| R2265            | 0662057A49        |  |
| R2266            | 0611072A09        |  |
| R2267            | 0662057A35        |  |
| R2269            | 0662057A01        |  |
| R2270            | 0662057A41        |  |
| R2271 thru 2274  | 0662057A01        |  |
| R2330            | 0662057B47        |  |
| R2333,2334       | 0662057A21        |  |
| R2335            | 0662057A17        |  |
| R2336,2337       | 0662057A21        |  |
| R2338            | 0662057A61        |  |
| R2339            | 0662057A49        |  |
| R2340            | 0662057A73        |  |
| R2400            | 0662057A33        |  |
| R2401            | 0662057A57        |  |
| R2402            | 0662057A49        |  |
| R2403            | 0662057A25        |  |
| R2404            | 0662057A41        |  |
| R2407            | 0662057A33        |  |
| R2408            | 0662057A59        |  |
| R2409            | 0662057A21        |  |
| R2410            | 0662057A73        |  |
| R2411            | 0662057A65        |  |
| R2412            | 0662057A73        |  |
| R2415            | 0662057A01        |  |
| R2500            | 0662057A11        |  |
| R2501            | 0611079A21        |  |
| R2502            | 0662057B08        |  |
| R2503            | 0662057A13        |  |
| R2504            | 0662057A73        |  |
| R2505            | 0662057A85        |  |
| R2506            | 0662057A69        |  |
| R2507            | 0662057B47        |  |
| R2508            | 0662057A21        |  |
| R2509            | 0662057A17        |  |
| R2510            | 0662057A21        |  |
| R2511            | 0662057A11        |  |
| R2512            | 0662057A57        |  |
| R2513,2514       | 0662057A21        |  |
| R2515            | 0662057A11        |  |

**TRD6431C Receiver Module (136 to 174 MHz)**

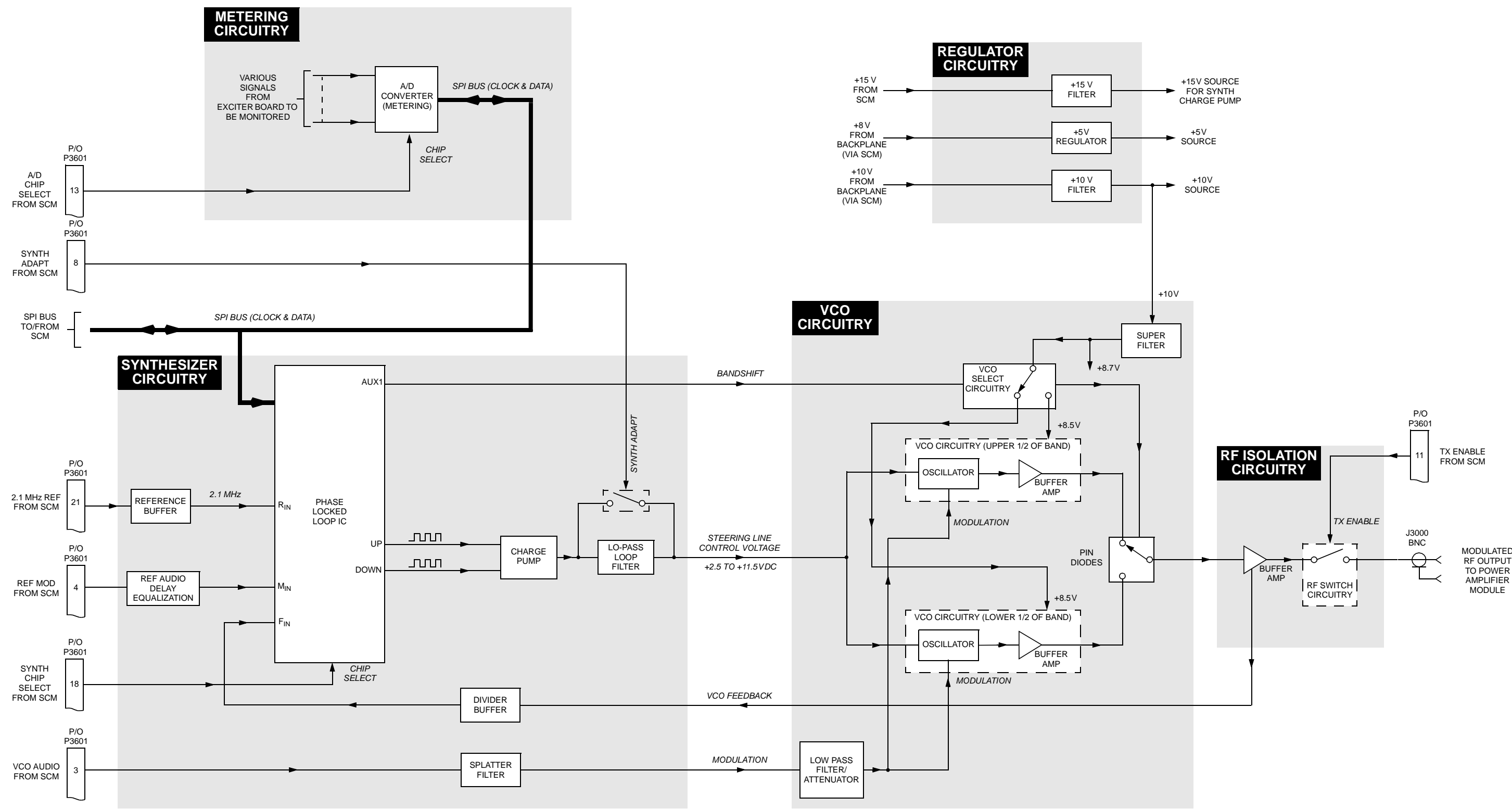
| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                      |
|------------------|-------------------|----------------------------------|
| R2518            | 0662057A17        | Chip Res 47 Ohms                 |
| R2519,2520       | 0662057A73        | Chip Res 10K Ohms                |
| R2521            | 0662057A83        | Chip Res 27K Ohms                |
| R2522,2523       | 0662057A37        | Chip Res 330 Ohms                |
| R2524            | 0680149M01        | 470 Ohms, $\pm 10\%$ ; 240 mW    |
| R2525            | 0662057A37        | Chip Res 330 Ohms                |
| R2526            | 0662057A31        | Chip Res 180 Ohms                |
| R2527,2528       | 0662057A09        | Chip Res 22 Ohms                 |
| R2529            | 0662057A83        | Chip Res 27K Ohms                |
| R2600            | 0611079A26        | 10 Ohms, $\pm 5\%$ ; 1/10 W      |
| R2601,2602       | 0662057A41        | Chip Res 470 Ohms                |
| R2610,2611       | 0611072A15        | 39 Ohms, $\pm 5\%$ ; 1/4W        |
| R2612            | 0662057A45        | Chip Res 680 Ohms                |
| R2613            | 0662057A57        | Chip Res 2200 Ohms               |
| R2614,2615       | 0662057A47        | Chip Res 820 Ohms                |
| R2616            | 0662057A41        | Chip Res 470 Ohms                |
| R2617            | 0662057A33        | Chip Res 220 Ohms                |
| R2618            | 0611079A42        | 47 Ohms, $\pm 5\%$ ; 1/10 W      |
| R2619            | 0662057A33        | Chip Res 220 Ohms                |
| R2620            | 0662057A11        | Chip Res 27 Ohms                 |
| R2621            | 0662057A35        | Chip Res 270 Ohms                |
| R2622            | 0662057B47        | Chip Res 0 Ohms $\pm 0.050$ Ohms |
| R2623            | 0662057A21        | Chip Res 68 Ohms                 |
| R2700            | 0662057A17        | Chip Res 47 Ohms                 |
| R2701 thru 2703  | 0662057A41        | Chip Res 470 Ohms                |
| R2704            | 0662057A89        | Chip Res 47K Ohms                |
| R2705            | 0662057A29        | Chip Res 150 Ohms                |
| R2706            | 0662057A69        | Chip Res 6800 Ohms               |
| R2707,2708       | 0662057A59        | Chip Res 2700 Ohms               |
| R2709            | 0680149M01        | 470 Ohms, $\pm 10\%$ ; 240 mW    |
| R2710            | 0662057A73        | Chip Res 10K Ohms                |
| R2711            | 0662057A83        | Chip Res 27K Ohms                |
| R2712            | 0662057A37        | Chip Res 330 Ohms                |
| R2713            | 0662057A49        | Chip Res 1000 Ohms               |
| R2714            | 0662057A73        | Chip Res 10K Ohms                |
| R2715            | 0662057A35        | Chip Res 270 Ohms                |
| R2716,2717       | 0662057A59        | Chip Res 2700 Ohms               |
| R2718            | 0662057A17        | Chip Res 47 Ohms                 |
| R2719            | 0662057A01        | Chip Res 10 Ohms                 |
| R2720            | 0662057A29        | Chip Res 150 Ohms                |
| R2721            | 0662057A41        | Chip Res 470 Ohms                |
| R2722            | 0662057A89        | Chip Res 47K Ohms                |
| R2723            | 0662057B47        | Chip Res 0 Ohms $\pm 0.050$ Ohms |
| R2724            | 0662057A01        | Chip Res 10 Ohms                 |
| R2725            | 0662057A35        | Chip Res 270 Ohms                |
| R2726            | 0680149M01        | 470 Ohms, $\pm 10\%$ ; 240 mW    |
| R2727            | 0662057A01        | Chip Res 10 Ohms                 |
| R2728            | 0662057A83        | Chip Res 27K Ohms                |
| R2729            | 0662057A37        | Chip Res 330 Ohms                |
| R2730            | 0662057A49        | Chip Res 1000 Ohms               |
| R2731            | 0662057A35        | Chip Res 270 Ohms                |
| R2800            | 0662057A67        | Chip Res 5600 Ohms               |
| R2801,2802       | 0662057A73        | Chip Res 10K Ohms                |
| R2803            | 0662057A41        | Chip Res 470 Ohms                |
| R2804            | 0662057A37        | Chip Res 330 Ohms                |
| R2805            | 0662057A61        | Chip Res 3300 Ohms               |
| R2806            | 0662057A73        | Chip Res 10K Ohms                |
| R2807            | 0662057A59        | Chip Res 2700 Ohms               |
| R2808            | 0662057B47        | Chip Res 0 Ohms $\pm 0.050$ Ohms |
| R2809,2810       | 0662057A49        | Chip Res 1000 Ohms               |
| R2811            | 0662057A61        | Chip Res 3300 Ohms               |
| R2812            | 0662057A09        | Chip Res 22 Ohms                 |
| R2813            | 0662057A61        | Chip Res 3300 Ohms               |
| R2814            | 0662057A57        | Chip Res 2200 Ohms               |
| R2815            | 0662057A73        | Chip Res 10K Ohms                |
| R2816,2817       | 0662057A67        | Chip Res 5600 Ohms               |
| R2818            | 0662057A21        | Chip Res 68 Ohms                 |
| R2819            | 0662057A61        | Chip Res 3300 Ohms               |
| R2820            | 0662057A49        | Chip Res 1000 Ohms               |
| R2821            | 0662057A09        | Chip Res 22 Ohms                 |
| R2822            | 0662057A71        | Chip Res 8200 Ohms               |
| R2823            | 0662057A73        | Chip Res 10K Ohms                |
| R2824            | 0662057A39        | Chip Res 390 Ohms                |
| R2825            | 0662057A65        | Chip Res 4700 Ohms               |
| R2826            | 0662057A57        | Chip Res 2200 Ohms               |
| R2827            | 0662057A37        | Chip Res 330 Ohms                |
| R2828            | 0662057A61        | Chip Res 3300 Ohms               |
| R2829            | 0662057A73        | Chip Res 10K Ohms                |
| R2830            | 0662057A49        | Chip Res 1000 Ohms               |
| R2831            | 0662057A57        | Chip Res 2200 Ohms               |
| R2832            | 0662057A25        | Chip Res 100 Ohms                |

**TRD6431C Receiver Module (136 to 174 MHz)**

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                          |
|---------------------------------------|-------------------|--------------------------------------|
| R2833                                 | 0662057A73        | Chip Res 10K Ohms                    |
| R2834                                 | 0662057A67        | Chip Res 5600 Ohms                   |
| R2835                                 | 0662057A25        | Chip Res 100 Ohms                    |
| R2836                                 | 0662057A73        | Chip Res 10K Ohms                    |
| R2837                                 | 0662057A61        | Chip Res 3300 Ohms                   |
| R2838                                 | 0662057A89        | Chip Res 47K Ohms                    |
| R2839                                 | 0662057A47        | Chip Res 820 Ohms                    |
| R2840,2841                            | 0662057A73        | Chip Res 10K Ohms                    |
| R2842                                 | 0662057A89        | Chip Res 47K Ohms                    |
| R2843                                 | 0662057A67        | Chip Res 5600 Ohms                   |
| R2869,2870                            | 0662057A97        | Chip Res 100K Ohms                   |
| R2875                                 | 0662057A11        | Chip Res 27 Ohms                     |
| <b>SHIELD:</b>                        |                   |                                      |
| SH2330                                | 1583004X02        | Corral Large                         |
| SH2400                                | 1583004X02        | Corral Large                         |
| SH2610                                | 1583004X01        | Corral Large                         |
| SH2700,2701                           | 2682680X01        | Shield VCO                           |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |                                      |
| U2050                                 | 5182374Y01        | IC A/D 8 BIT                         |
| U2103,2104                            | 5113816A07        | 5-Volt Positive Regulator            |
| U2220                                 | 5113818A14        | IC DL OP AMP RAIL TO RAIL            |
| U2221                                 | 5180057S02        | IC CMOS CUST DA CONV 13" REEL        |
| U2500                                 | 5184523T08        | IC ABACUS JEDEZ 52QFP                |
| U2501                                 | 5113805A08        | Triple 3-Input AND Gate              |
| U2502                                 | 5113819A08        | Low Power                            |
| U2800                                 | 5184602T03        | IC                                   |
| U2801                                 | 5113819A08        | Low Power                            |
| U2802                                 | 5113806A21        | Quad Analog Switch Multiplexer       |
| U2810                                 | 5113805A18        | Dual D-Type Flip-Flop with Set/Reset |
| <b>CRYSTAL: (SEE NOTE)</b>            |                   |                                      |
| Y2400                                 | 4805846W05        | XTAL FLTR 44.85M IM W CLIP           |
| Y2401,2402                            | 4805846W07        | XTAL FLTR 44.85M W CLIP              |
| <b>NON-REFERENCED ITEMS</b>           |                   |                                      |
|                                       | 1583004X02        | CORRAL LARGE (used with SH2220)      |
|                                       | 2683006X01        | COVER LARGE (used with SH2220)       |
|                                       | 5482006W01        | Label, PCB barcode                   |
|                                       | 5482006W02        | ribbon, thermal transfer             |
|                                       | 5484960T02        | Label Blank Barcode                  |

**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

EXCITER MODULE  
MODEL TTD6301C

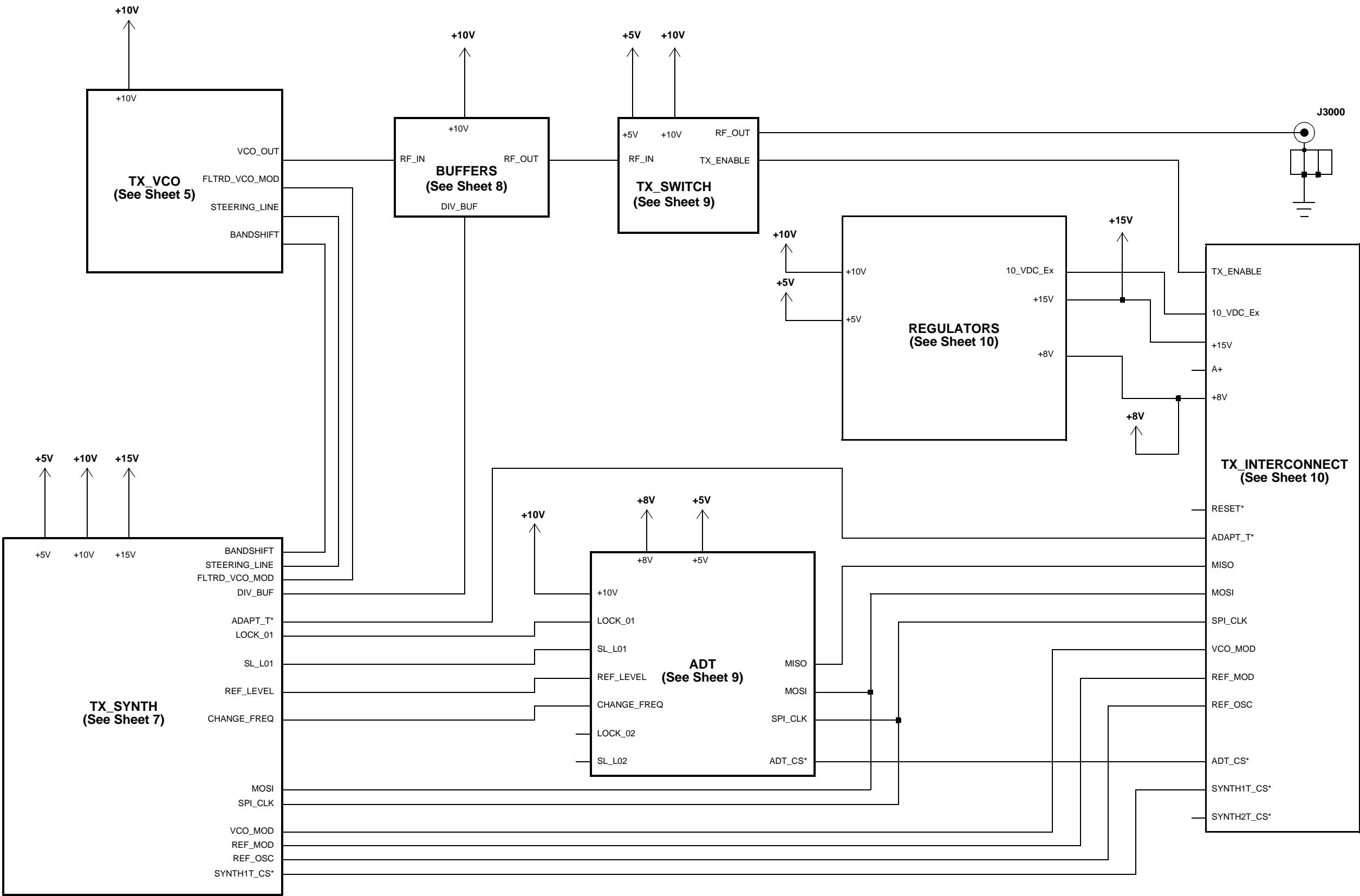


EXCITER MODULE FUNCTIONAL BLOCK DIAGRAM

**EXCITER MODULE**  
**MODEL TTD6301C**

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EXCITER MODULE  
MODEL TTD6301C



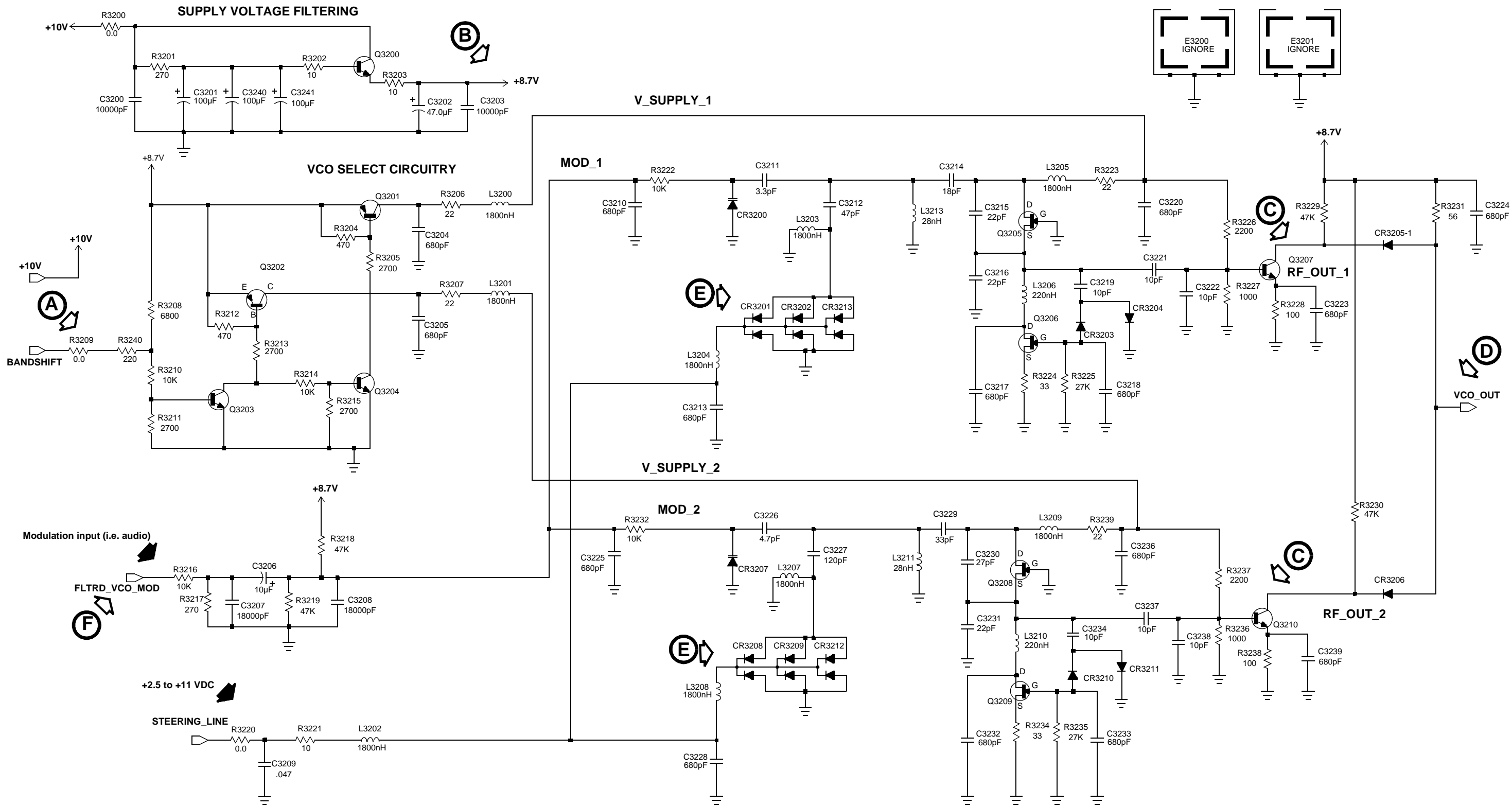
MODULE BLOCK DIAGRAM

EXCITER MODULE

MODEL TTD6301C

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| A           | Bandshift signal from synthesizer (U3402-pin 7, AUX 1) controls series pass transistor Q3201 and Q3202 to provide supply voltage to high VCO (upper half of band) or low VCO (lower half of band).<br>Bandshift signal Hi    Low range VCO selected (132-153 MHz)<br>Bandshift signal Lo    High range VCO selected (153-174 MHz)  |
| B           | +8.7 V supply; +10 V filtered by Supply Voltage Filtering Q3200,C3201,C3240, C3241 and R3201   |
| C           | Enabled VCO (selected by VCO select circuitry) generates RF output frequency determined by the DC control voltage at steering line.  |
| D           | VCO_OUT; Output power between +3 dBm and +9 dBm  |
| E           | The frequency of the VCO's are tuned with CR3201, CR3202 and CR3213 for the low range and CR3208, CR3209 and CR3212 for the high range.<br><br>If the synthesizer is not locked, steering line voltage will be either less than +2.5 V or higher than +11V.<br><br>Low range VCO enabled<br>Steering line voltage +4V approx. 132 Mhz<br>Steering line voltage +9V approx. 153 Mhz<br><br>High range VCO enabled<br>Steering line voltage +4V approx. 153 Mhz<br>Steering line voltage +9V approx. 174 Mhz |
| F           | VCO modulation signal from U3401-1   |

EXCITER MODULE  
MODEL TTD6301C



VCO CIRCUITRY



EXCITER MODULE

MODEL TTD6301C

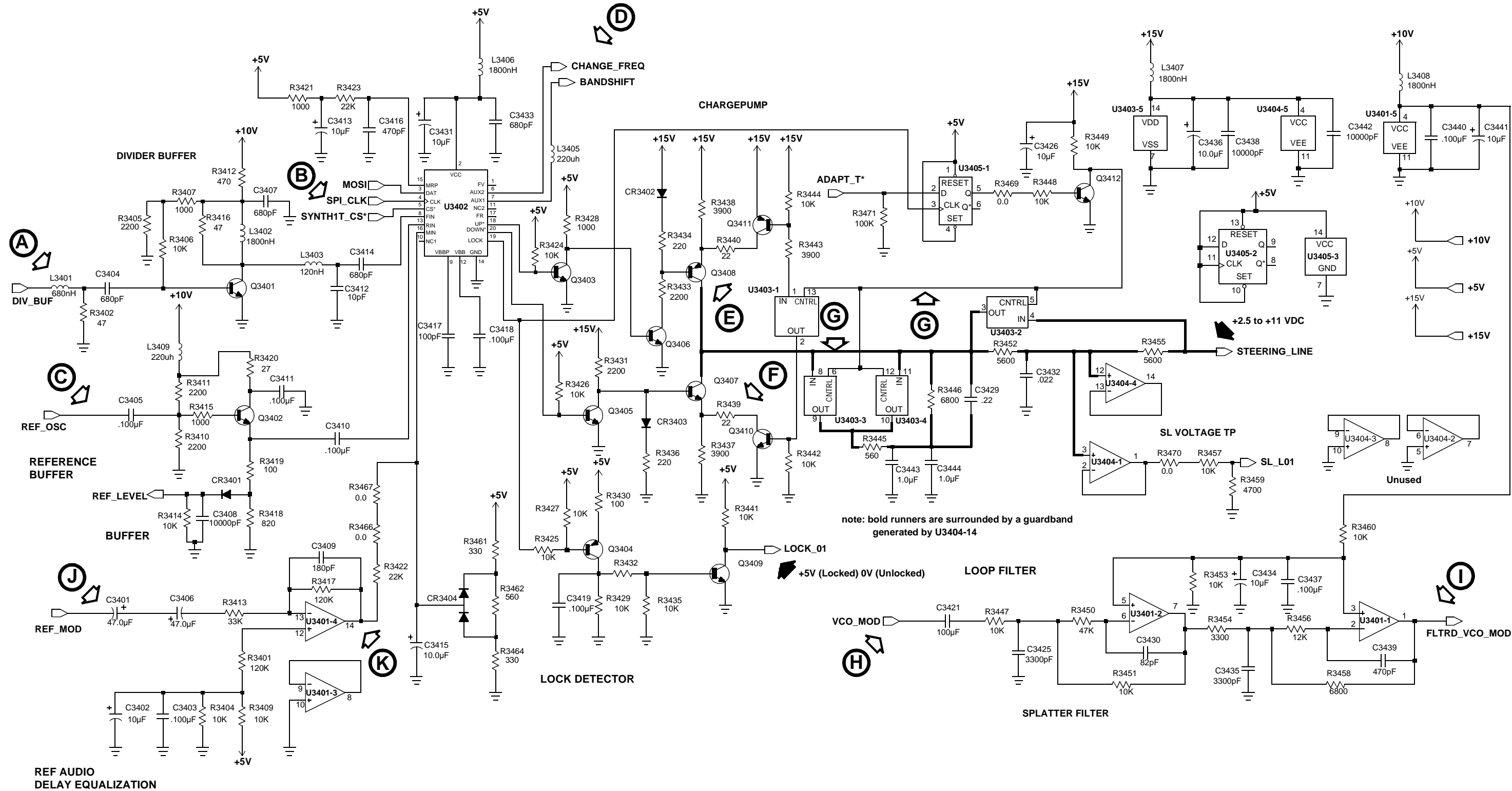
Synthesizer Service Notes

| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| Ⓐ           | A sample of the VCO output signal is fed to the VCO Divider Buffer Q3401 and output to the feedback input at U3402–pin 8.   |
| Ⓑ           | The MOSI serial data signal contains frequency selection data from the Host processor on the SCM. This data is clocked by the SPI CLOCK signal.   |
| Ⓒ           | 2.1 MHz input from the SCM is buffered by Q3402 and fed to the Reference Input (RIN) of PLL synthesizer U3402–pin 13.   |
| Ⓓ           | PLL synthesizer U3402 compares the frequency of RIN (2.1 MHz from the SCM) and FIN (VCO feedback signal divided internally per programming data from station control via MOSI data line) and generates variable-width UP and DOWN pulses (pins 18 & 20). With the synthesizer locked, pins 18 & 20 generate extremely small pulse widths. With VCO <i>below</i> desired frequency, pin 18 pulse widths increase; with VCO <i>above</i> desired frequency, pin 20 pulse widths increase. |
| Ⓔ           | +15 V with narrow 0.8 V DOWN pulses at 6.25 kHz or 5 kHz rate when locked.  |
| Ⓕ           | 0 V with narrow 0.8 V UP pulses at 6.25 kHz or 5 kHz or 5 kHz rate when locked.   |
| Ⓖ           | The charge pump and loop filter convert UP/DOWN pulses from the PLL IC to a dc steering voltage which is fed to dual VCO circuitry to control the VCO output frequency.   |
| Ⓕ           | VCO MOD consists of audio/data for modulating the VCO rf signal.  |
| Ⓘ           | U3401-1 and U340-2 are low-pass filters that reject signals above 6 kHz to eliminate over-deviation of the RF output signal.  |
| Ⓙ           | REF_MOD consists of digitized audio/data for modulating the phase modulator of U3402 pin 16.  |
| Ⓚ           | U3401-4 is a delay equalizer  |

U3402 Synthesizer IC

| Pin # | Signal Name              | Description/Nominal Voltage  |
|-------|--------------------------|--|
| 1     | FV                       | Test point; divided down VCO frequency;6.25 kHz or 5 kHz sawtooth waveform in locked condition                                   |
| 2     | VCC                      | IC power; +5 V   |
| 3     | DATA                     | Serial data input; 0–5 V logic level   |
| 4     | CLK                      | Clock for serial data programming; 0–5 V logic level   |
| 5     | $\overline{\text{CS}}$   | Chip select; low when programming, high when not programming; 0–5 V logic level  |
| 6     | AUX2                     | Change frequency; toggles between logic low and high with every frequency change   |
| 7     | AUX1                     | Bandshift; high selects low frequency VCO; low selects high frequency VCO  |
| 8     | FIN                      | Feedback rf input; transmit operating frequency riding on 1.4 V  |
| 9     | VBBP                     | DC bias for prescaler input; 1.4 V   |
| 10    | NC1                      | Not used   |
| 11    | NC2                      | Not used   |
| 12    | VBB                      | DC bias for reference divider input; 1.4 V   |
| 13    | RIN                      | Reference divider input; 1 Vp-p, 2.1 MHz square wave riding on 1.4 V   |
| 14    | GND                      | IC ground; 0 V   |
| 15    | MRP                      | Connection to external ramp circuit for phase modulator; steeply sloped ramp, ramping between 0 and 5 V @ 6.25 kHz or 5 kHz rate |
| 16    | MIN                      | Modulation input to phase modulator; +2.5 V  |
| 17    | FR                       | Test point; divided down 2.1 MHz reference @ 6.25 kHz or 5 kHz in a locked condition.  |
| 18    | $\overline{\text{UP}}$   | When locked, narrow (<1 microsecond) down pulses @ 6.25 kHz or 5 kHz riding on 0.7 V   |
| 19    | $\overline{\text{LOCK}}$ | Loop locked; when locked, narrow (<1 microsecond) down pulses @ 6.25 kHz or 5 kHz riding on 5 V                                  |
| 20    | $\overline{\text{DOWN}}$ | When locked, narrow (<1 microsecond) down pulses @ 6.25 kHz or 5 kHz riding on 0.7 V   |

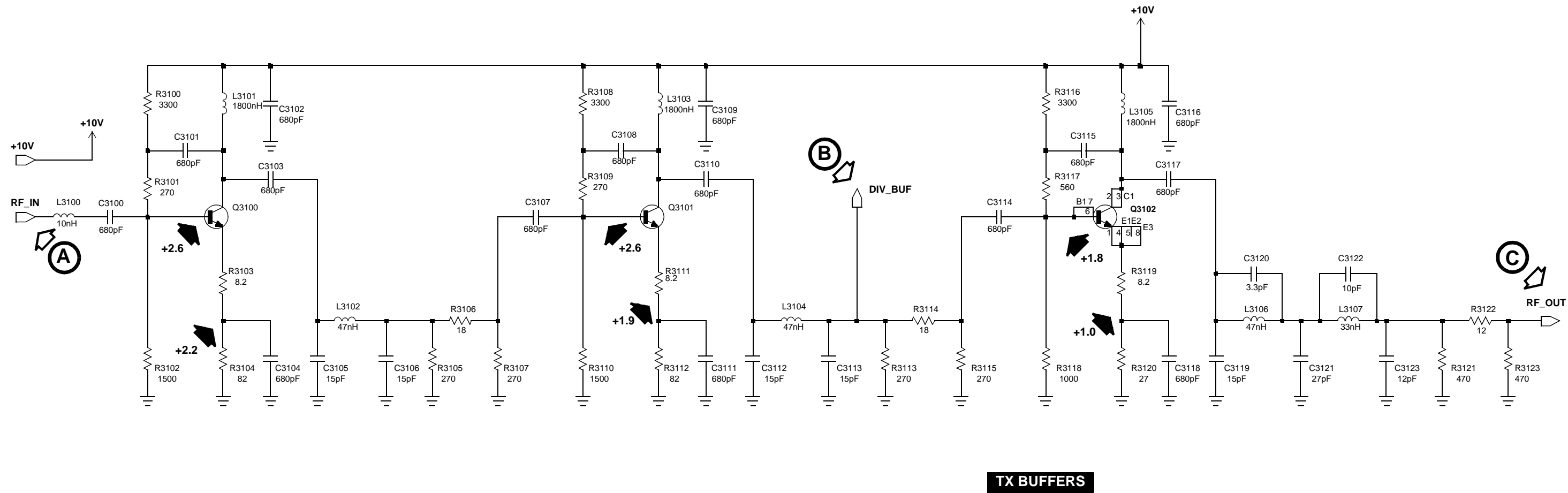
EXCITER MODULE  
MODEL TTD6301C



TX SYNTHESIZER

# EXCITER MODULE

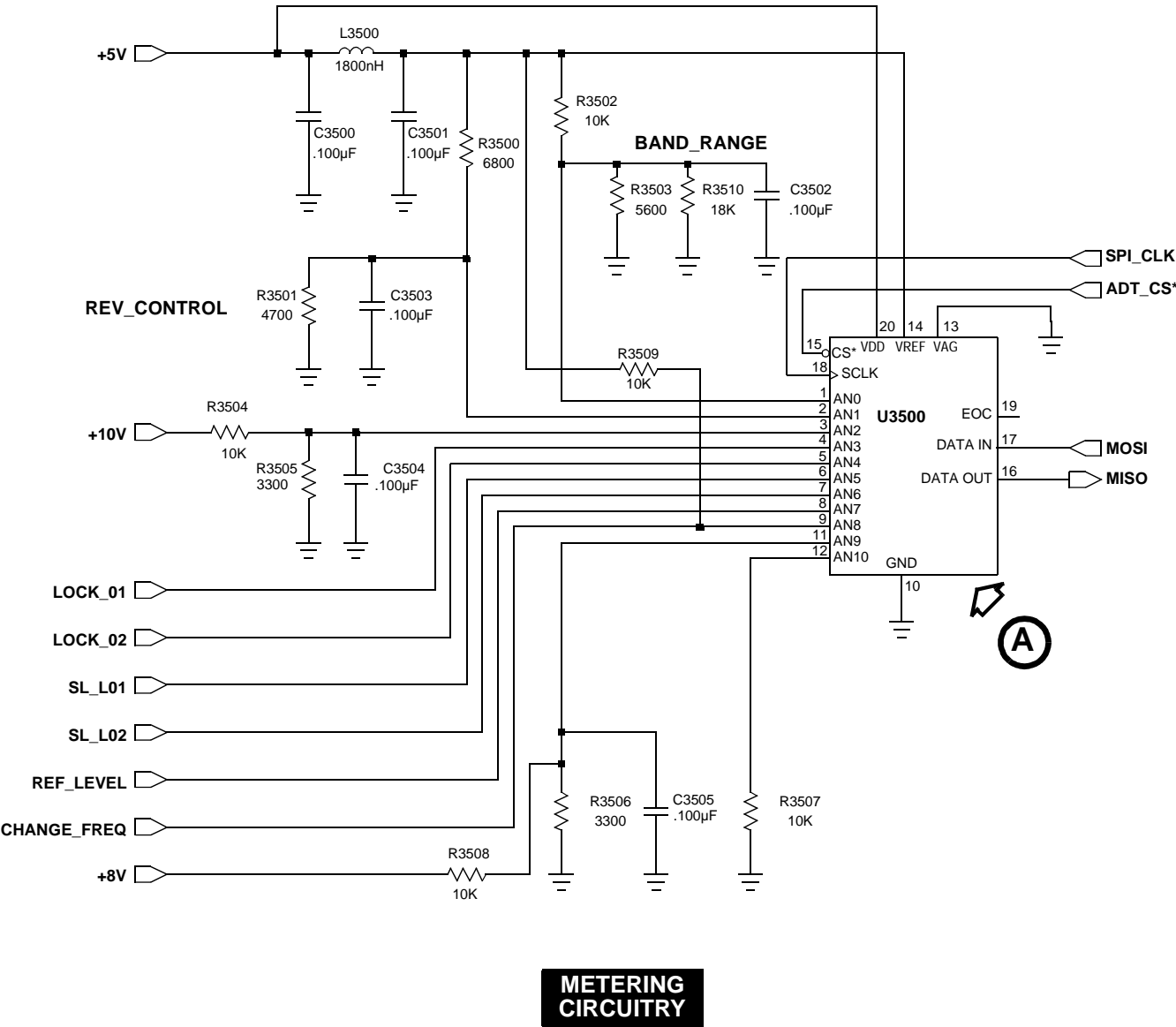
## MODEL TTD6301C



### TX Buffers Service Notes

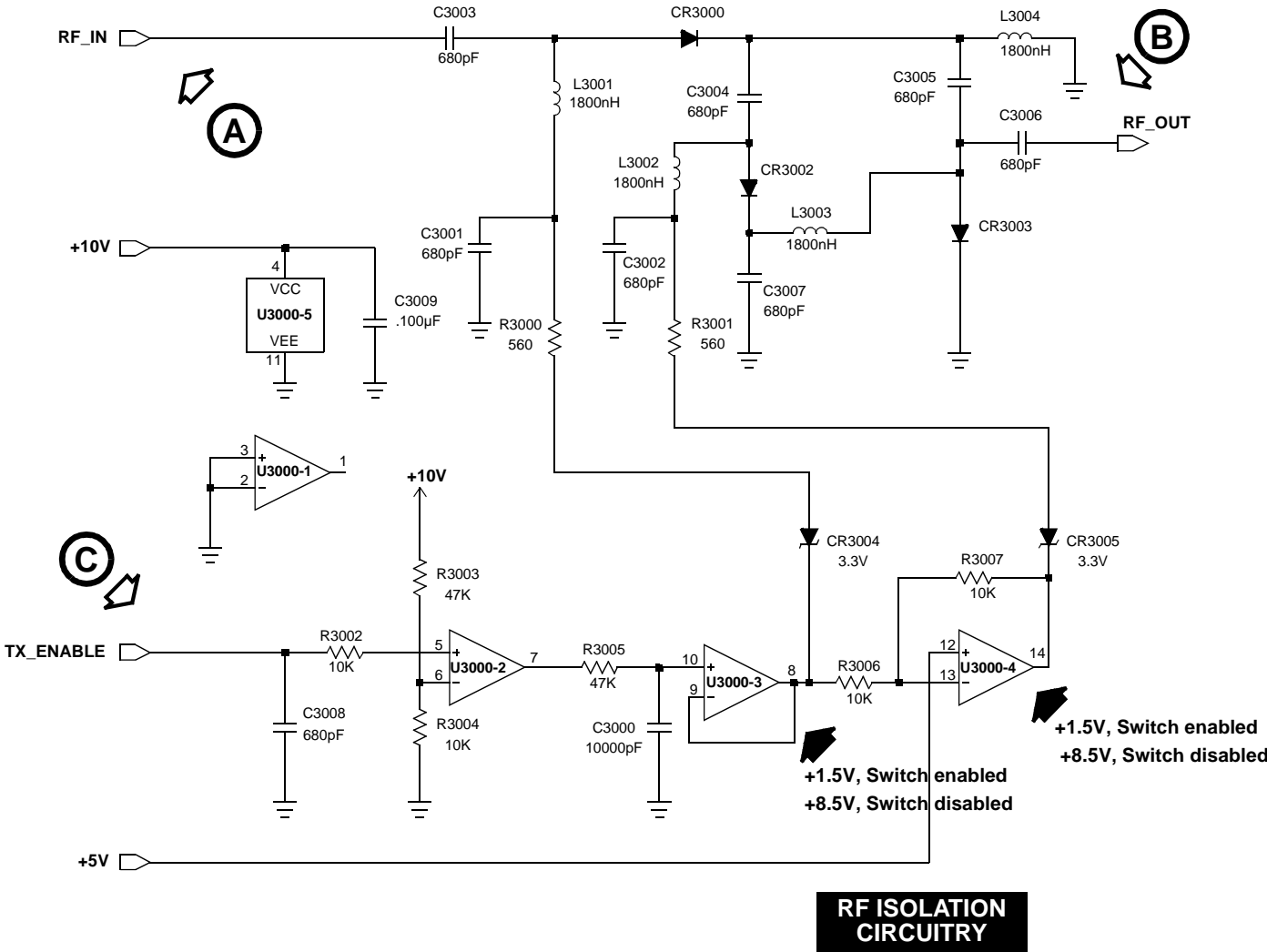
| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| (A)         | RF_IN from VCO_OUT; RF level approx. +6 to +9 dBm  |
| (B)         | DIV_BUF; RF level approx. +12 dBm  |
| (C)         | RF_OUT to TX SWITCH (RF ISOLATION CIRCUITRY); RF level approx. +14 dBm (+12 to +16 dBm). Feedback to the synthesizer chip. |

EXCITER MODULE  
MODEL TTD6301C



Metering Service Notes

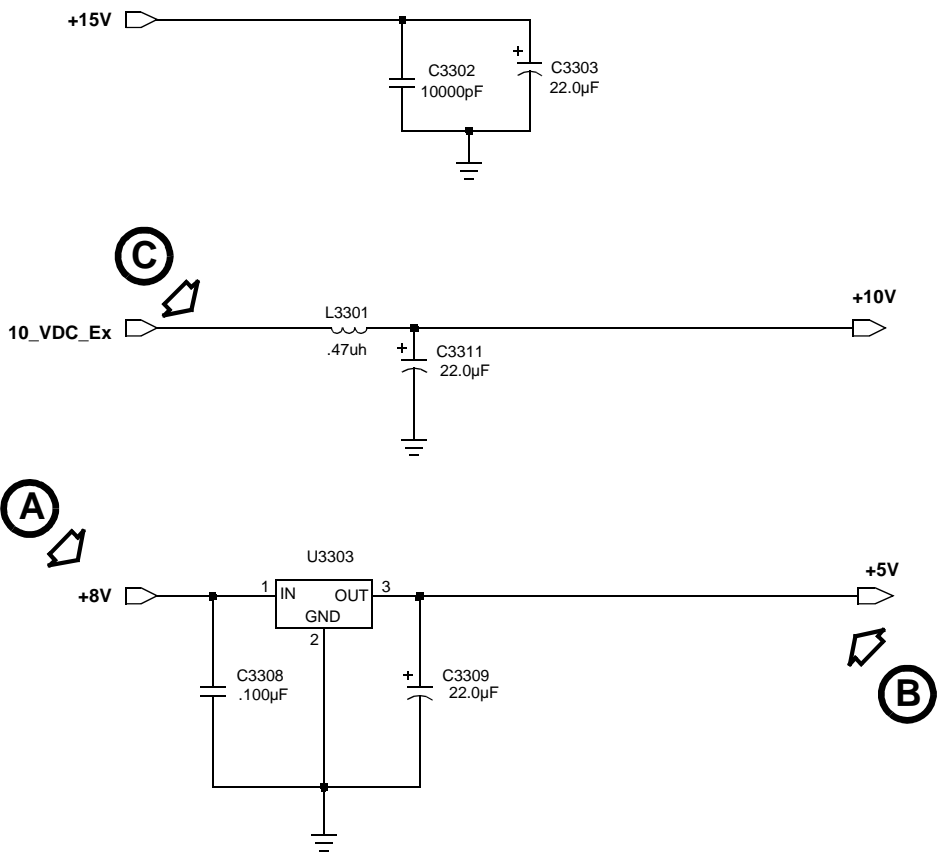
| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| <b>A</b>    | The 8 bit A/D converter communicates with the Station Control Module via the SPI bus lines MOSI and MISO. The inputs to the chip are levels that are used for diagnostic purposes and to identify the type of exciter board. |



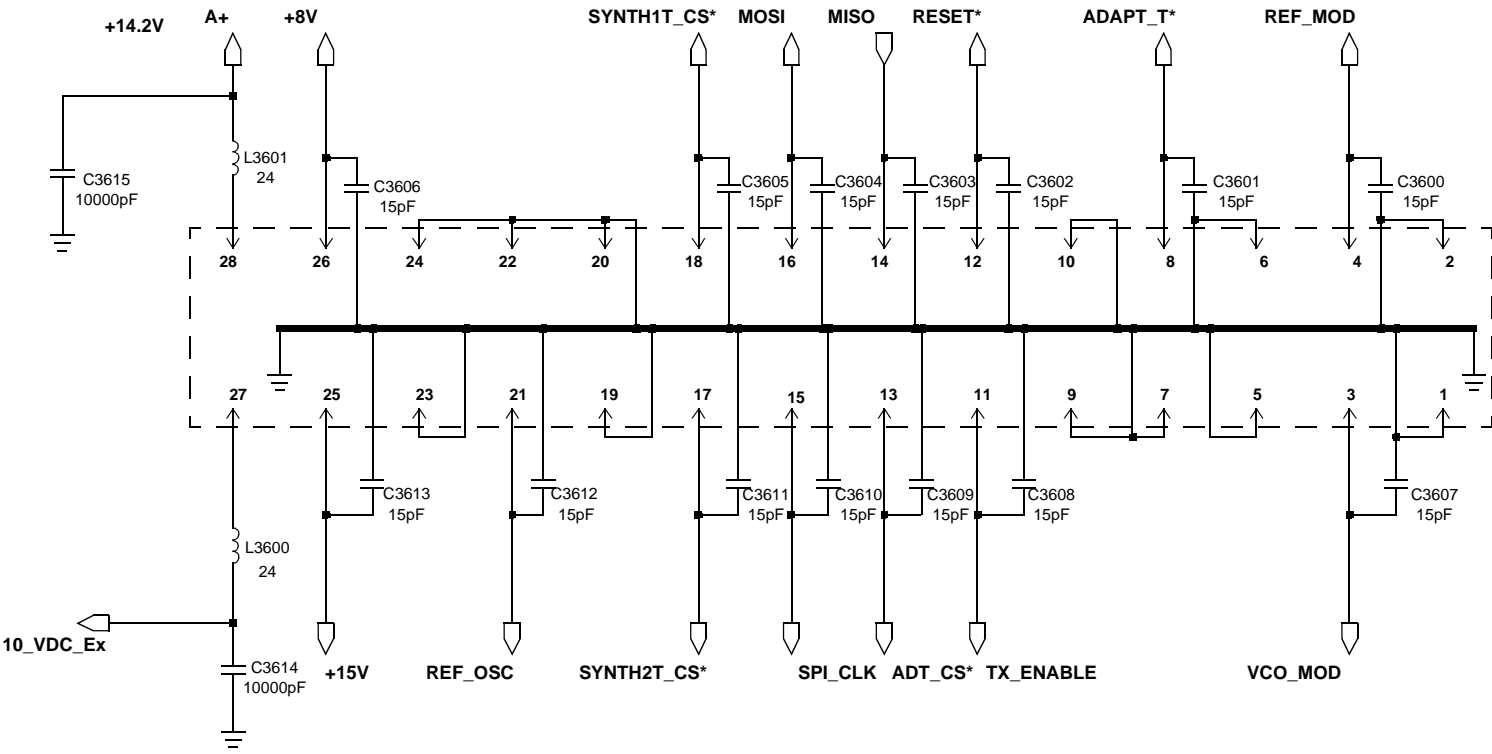
TX Switch Service Notes

| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| <b>A</b>    | Input from Tx Buffer. RF_IN; RF level approx. +14 dBm;  |
| <b>B</b>    | RF_OUT to the BNC connector (connected to the PA module). RF level approx. +14 dBm (+12 to +16 dBm) when Tx-switch is enabled; Tx-level < -30 dBm when Tx-switch is disabled  |
| <b>C</b>    | TX_ENABLE; 0-5 V logic level; High level enables the switch; Low level disables the switch<br>When the switch is enabled, the output of U3000-3 is approx. +8.5 V, this feeds current through CR3000. At the same time, the output of U3000-4 is approx. +1.5 V, no current is therefore feed through CR3001 and CR3003.<br>When the switch is disabled, the output of U3000-4 is approx. +8.5 V, this feeds current through CR3001 and CR3003. At the same time, the output of U3000-3 is approx. +1.5 V, no current is therefore feed through CR3000. |

EXCITER MODULE  
MODEL TTD6301C



REGULATOR  
CIRCUITRY

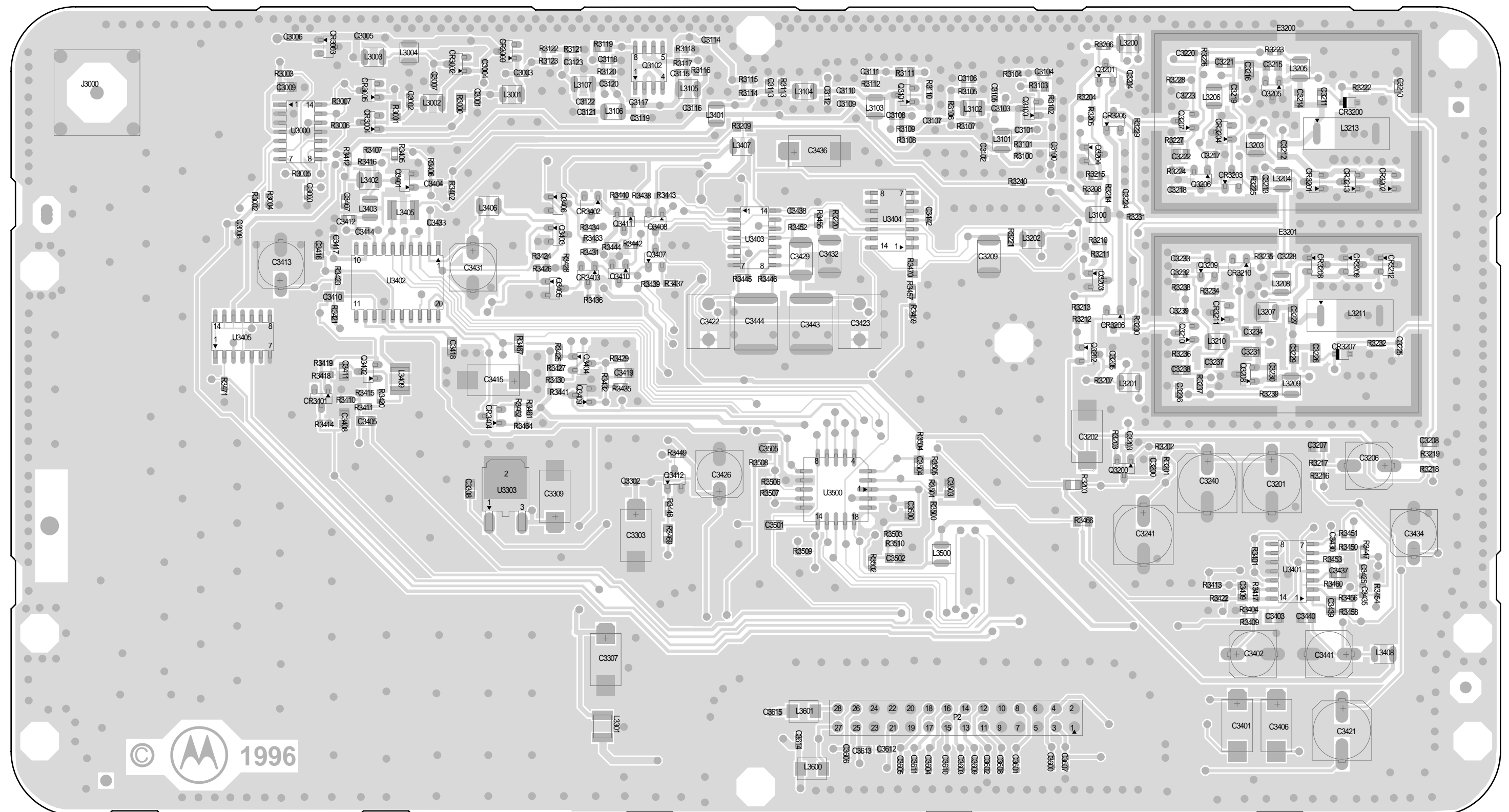


EXCITER/SCM  
CONNECTOR

Regulators Service Notes

| Signal Path | Description/Nominal Signal Levels                           |
|-------------|---|
| A           | +8V; Input for the +5 volt regulator U3303                  |
| B           | +5V; Supply for the synthesizer and A/D converter           |
| C           | 10_VDC_Ex; supplies the VCO, Buffer and Tx-switch circuitry |

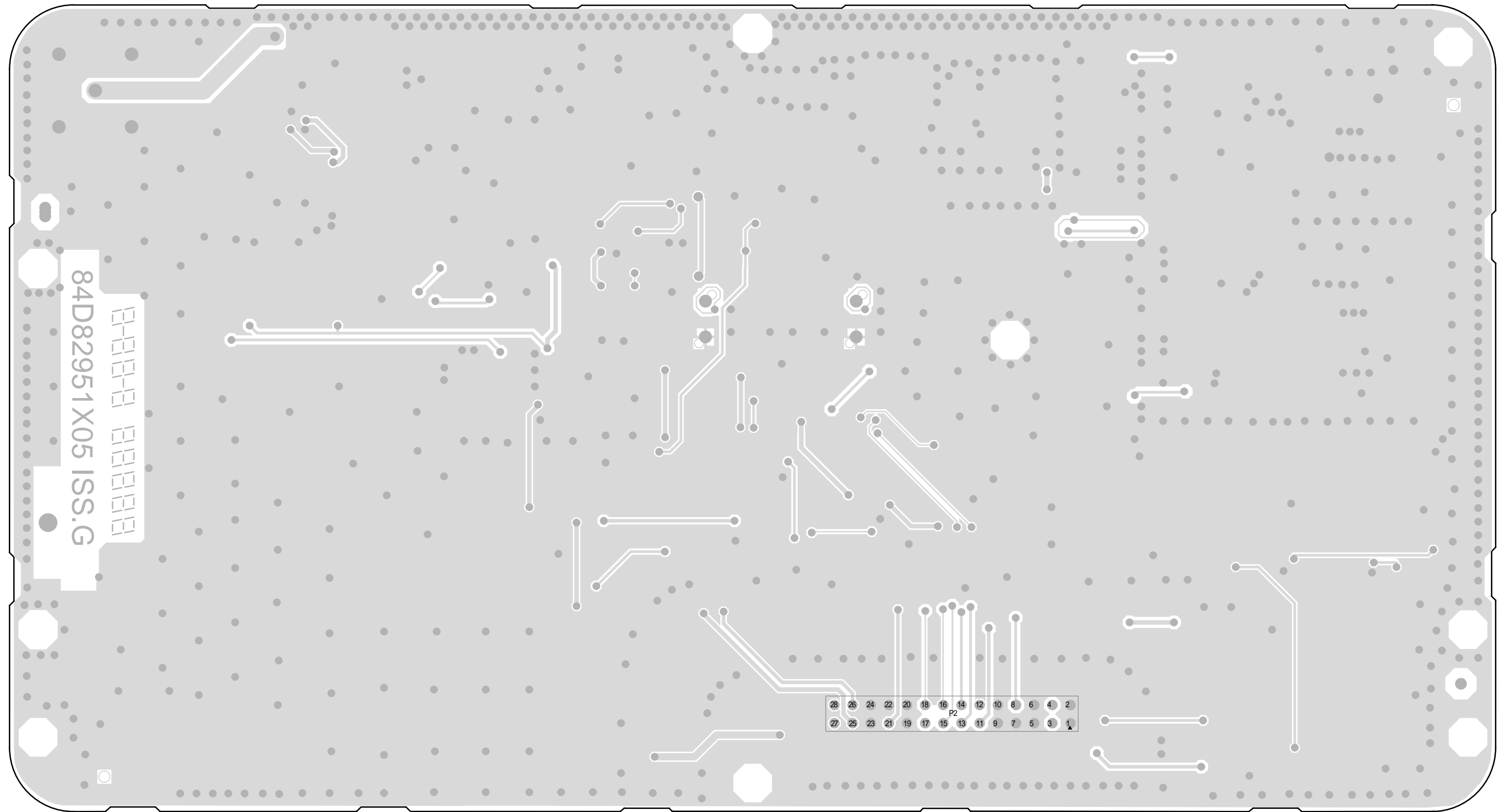
**EXCITER MODULE**  
**MODEL TTD6301C**



### EXCITER MODULE BOARD DETAIL - COMPONENT SIDE

68P81094E12-D  
Board Detail (Sheet 11 of 14)  
12/26/01

EXCITER MODULE  
MODEL TTD6301C



EXCITER MODULE BOARD  
DETAIL - SOLDER SIDE

**TTD6301C Exciter Module (136 to 174MHz)**

| REFERENCE SYMBOL   | MOTOROLA PART NO. | DESCRIPTION                            |
|--|-------------------|--|
| <b>CAPACITOR, FIXED: <math>\mu\text{F}</math> <math>\pm 10\%</math>; 100 V:</b><br>UNLESS OTHERWISE STATED |                   |  |
| C3000  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C3001-3008   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3009  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3100-3104   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3105-3106   | 2113740F31        | 15 pF, $\pm 5\%$ ; 50V                 |
| C3107-3111   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3112-3113   | 2113740F31        | 15 pF, $\pm 5\%$ ; 50V                 |
| C3114-3118   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3119  | 2113740F31        | 15 pF, $\pm 5\%$ ; 50V                 |
| C3120  | 2113740F15        | 3.3 pF, $\pm 0.25$ pF; 50V             |
| C3121  | 2113740F37        | 27 pF, $\pm 5\%$ ; 50V                 |
| C3122  | 2113740F27        | 10 pF, $\pm 5\%$ ; 50V                 |
| C3123  | 2113740F29        | 12 pF, $\pm 5\%$ ; 50V                 |
| C3200  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C3201  | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C3202  | 2311049A23        | 47 $\mu\text{F}$ , $\pm 10\%$ ; 10 V   |
| C3203  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C3204-3205   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3206  | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V   |
| C3207-3208   | 2113741A51        | 0.018 $\mu\text{F}$ , $\pm 5\%$ ; 50V  |
| C3209  | 0882422W29        | CAP FILM SM 0.047 $\mu\text{F}$ 63V 5% |
| C3210  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3211  | 2113901A17        | CAP CHIP HI Q 3.3 pF $\pm 0.25$ pF     |
| C3212  | 2113901A50        | CAP CHIP HI Q 47 pF $\pm 5\%$          |
| C3213  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3214  | 2113901A36        | CAP CHIP HI Q 18 pF $\pm 5\%$          |
| C3215-3216   | 2113901A38        | CAP CHIP HI Q 22 pF $\pm 5\%$          |
| C3217-3218   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3219  | 2113901A29        | CAP CHIP HI Q 10 pF $\pm 0.50$ pF      |
| C3220  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3221-3222   | 2113901A29        | CAP CHIP HI Q 10 pF $\pm 0.50$ pF      |
| C3223-3225   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3226  | 2113901A21        | CAP CHIP HI Q 4.7 pF $\pm 0.25$ pF     |
| C3227  | 2113740A57        | 120 pF, $\pm 5\%$ ; 50V                |
| C3228  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3229  | 2113901A45        | CAP CHIP HI Q 33 pF $\pm 5\%$          |
| C3230  | 2113901A41        | CAP CHIP HI Q 27 pF $\pm 5\%$          |
| C3231  | 2113901A38        | CAP CHIP HI Q 22 pF $\pm 5\%$          |
| C3232-3233   | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3234  | 2113901A29        | CAP CHIP HI Q 10 pF $\pm 0.50$ pF      |
| C3236  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3237-3238   | 2113901A29        | CAP CHIP HI Q 10 pF $\pm 0.50$ pF      |
| C3239  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3240-3241   | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C3302  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C3303  | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C3307  | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C3308  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3309  | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C3401  | 2311049A23        | 47 $\mu\text{F}$ , $\pm 10\%$ ; 10 V   |
| C3402  | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V   |
| C3403  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3404  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3405  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3406  | 2311049A23        | 47 $\mu\text{F}$ , $\pm 10\%$ ; 10 V   |
| C3407  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3408  | 2113741A45        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C3409  | 2113740A61        | 180 pF, $\pm 5\%$ ; 50 V               |
| C3410-3411   | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3412  | 2113740F27        | 10 pF, $\pm 5\%$ ; 50V                 |
| C3413  | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V   |
| C3414  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3415  | 2311049A45        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 35 V   |
| C3416  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C3417  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C3418-3419   | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3421  | 2380090M36        | CAP 100 $\mu\text{F}$ 25V              |
| C3425  | 2113741F37        | 3300 pF, $\pm 5\%$ ; 50V               |
| C3426  | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V   |
| C3429  | 0882422W31        | CAP FILM SM 0.22 $\mu\text{F}$ 63V 5%  |
| C3430  | 2113740F49        | 82 pF, $\pm 5\%$ ; 50V                 |
| C3431  | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V   |
| C3432  | 0882422W28        | CAP FILM SM 0.022 $\mu\text{F}$ 63V 5% |
| C3433  | 2113741F21        | 680 pF, $\pm 5\%$ ; 50V                |
| C3434  | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V   |
| C3435  | 2113741F37        | 3300 pF, $\pm 5\%$ ; 50V               |
| C3436  | 2311049A45        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 35 V   |
| C3437  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V   |
| C3438  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |

**TTD6301C Exciter Module (136 to 174MHz)**

| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION                          |
|---|-------------------|--------------------------------------|
| C3439   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V             |
| C3440   | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V |
| C3441   | 2380090M24        | 10 $\mu\text{F}$ , $\pm 20\%$ ; 50 V |
| C3442   | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V |
| C3443-3444  | 0882422W45        | CAP FILM SM 1.0 $\mu\text{F}$ 63V 5% |
| C3500-3505  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V |
| C3600-3613  | 2113740F31        | 15 pF, $\pm 5\%$ ; 50V               |
| C3614-3615  | 2113741F49        | 0.01 $\mu\text{F}$ , $\pm 5\%$ ; 50V |
| <b>DIODE: (SEE NOTE)</b>  |                   |                                      |
| CR3000  | 4882030V01        | Diode HP PIN                         |
| CR3002-3003   | 4882030V01        | Diode HP PIN                         |
| CR3004-3005   | 4813830A09        | Zener, 3.3 V                         |
| CR3200  | 4862824C01        | Diode Varactor                       |
| CR3201-3202   | 4813825A01        | 3V, dual                             |
| CR3203-3204   | 4813825A05        | Hot Carrier                          |
| CR3205-3206   | 4813825A06        | Pin,35 V                             |
| CR3207  | 4862824C01        | Diode Varactor                       |
| CR3208-3209   | 4813825A01        | 3V, dual                             |
| CR3210-3211   | 4813825A05        | Hot Carrier                          |
| CR3212-3213   | 4813825A01        | 3V, dual                             |
| CR3401  | 4813825A05        | Hot Carrier                          |
| CR3402-3403   | 4813833C10        | 0.1A, 70 V                           |
| CR3404  | 4813833C05        | Dual 70 V                            |
| <b>CONNECTOR, RECEPTACLE:</b><br>BNC CONN PCB VERTICAL RECEPT                   |                   |                                      |
| J3000   | 0982492W01        |                                      |
| <b>COIL, INDUCTOR:</b>  |                   |                                      |
| L3001-3004  | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3100   | 2462587X41        | IND CHIP LO-PRO 10.0 nH 5%           |
| L3101   | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3102   | 2462587X49        | IND CHIP LO-PRO 47.0 nH 5%           |
| L3103   | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3104   | 2462587X49        | IND CHIP LO-PRO 47.0 nH 5%           |
| L3105   | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3106   | 2462587X49        | IND CHIP LO-PRO 47.0 nH 5%           |
| L3107   | 2462587X47        | IND CHIP LO-PRO 33.0 nH 5%           |
| L3200-205   | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3206   | 2462587X57        | CHIP IND lo-pro 220 nH 5%            |
| L3207-3209  | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3210   | 2462587X57        | CHIP IND lo-pro 220 nH 5%            |
| L3211   | 0105950T45        | COIL HELICL MOLDED FIN.175 SQ        |
| L3213   | 0105950T45        | COIL HELICL MOLDED FIN.175 SQ        |
| L3301   | 2411087A22        | COIL; chip.47 $\mu\text{H}$          |
| L3401   | 2462587X64        | IND CHIP LO-PRO 680 nH 5%            |
| L3402   | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3403   | 2462587X54        | IND CHIP LO-PRO 120 nH 5%            |
| L3405   | 2411087A54        | 220 $\mu\text{H}$ , $\pm 10\%$       |
| L3406-3408  | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3409   | 2411087A54        | 220 $\mu\text{H}$ , $\pm 10\%$       |
| L3500   | 2462587N71        | 1800 nH, $\pm 5\%$                   |
| L3600-3601  | 2484657R01        | ferrite bead                         |
| <b>CONNECTOR, PLUG:</b><br>HDR 2 X 14 VERT                                      |                   |                                      |
| P2  | 2882982X01        |                                      |
| <b>TRANSISTOR: (SEE NOTE)</b>   |                   |                                      |
| Q3100-3101  | 4813827A03        | NPN                                  |
| Q3102   | 4813827A26        | Transistor; NPN                      |
| Q3200   | 4813824A10        | NPN                                  |
| Q3201-3202  | 4813824A17        | PNP                                  |
| Q3203-3204  | 4813824A10        | NPN                                  |
| Q3205-3206  | 4880141L06        | MOSFET                               |
| Q3207   | 4813827A03        | NPN                                  |
| Q3208-3209  | 4880141L06        | MOSFET                               |
| Q3210   | 4813827A03        | NPN                                  |
| Q3401   | 4813827A03        | NPN                                  |
| Q3402-3403  | 4813824A10        | NPN                                  |
| Q3404   | 4813824A17        | PNP                                  |
| Q3405-3407  | 4813824A10        | NPN                                  |
| Q3408   | 4813824A17        | PNP                                  |
| Q3409-3410  | 4813824A10        | NPN                                  |
| Q3411   | 4813824A17        | PNP                                  |
| Q3412   | 4813824A10        | NPN                                  |
| <b>RESISTOR, FIXED: <math>\pm 5\%</math>; 1/4 W:</b><br>UNLESS OTHERWISE STATED |                   |                                      |
| R3000-3001  | 0611079A68        | 560 5 1/10 W                         |
| R3002   | 0662057P10        | Chip Res 10K Ohms 1%                 |
| R3003   | 0662057A89        | Chip Res 47K Ohms                    |



TTD6301C Exciter Module (136 to 174MHz)

| REFERENCE<br>SYMBOL | MOTOROLA<br>PART NO. | DESCRIPTION                    |
|---------------------|----------------------|--------------------------------|
| R3004               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3005               | 0662057A89           | Chip Res 47K Ohms              |
| R3006-3007          | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3100               | 0662057A61           | Chip Res 3300 Ohms             |
| R3101               | 0662057A35           | Chip Res 270 Ohms              |
| R3102               | 0662057A53           | Chip Res 1500 Ohms             |
| R3103               | 0611079A24           | Res Fixed Chip 8.2 5 1/10W A/P |
| R3104               | 0662057A23           | Chip Res 82 Ohms               |
| R3105               | 0662057A35           | Chip Res 270 Ohms              |
| R3106               | 0662057A07           | Chip Res 18 Ohms               |
| R3107               | 0662057A35           | Chip Res 270 Ohms              |
| R3108               | 0662057A61           | Chip Res 3300 Ohms             |
| R3109               | 0662057A35           | Chip Res 270 Ohms              |
| R3110               | 0662057A53           | Chip Res 1500 Ohms             |
| R3111               | 0611079A24           | Res Fixed Chip 8.2 5 1/10W A/P |
| R3112               | 0662057A23           | Chip Res 82 Ohms               |
| R3113               | 0662057A35           | Chip Res 270 Ohms              |
| R3114               | 0662057A07           | Chip Res 18 Ohms               |
| R3115               | 0662057A35           | Chip Res 270 Ohms              |
| R3116               | 0662057A61           | Chip Res 3300 Ohms             |
| R3117               | 0662057A43           | Chip Res 560 Ohms              |
| R3118               | 0662057A49           | Chip Res 1000 Ohms             |
| R3119               | 0611079A24           | Res Fixed Chip 8.2 5 1/10W A/P |
| R3120               | 0662057A11           | Chip Res 27 Ohms               |
| R3121               | 0662057A41           | Chip Res 470 Ohms              |
| R3122               | 0662057A03           | Chip Res 12 Ohms               |
| R3123               | 0662057A41           | Chip Res 470 Ohms              |
| R3200               | 0611079A01           | O ohms, ±5%; 1/10 W            |
| R3201               | 0662057A35           | Chip Res 270 Ohms              |
| R3202-3203          | 0662057A01           | Chip Res 10 Ohms               |
| R3204               | 0662057A41           | Chip Res 470 Ohms              |
| R3205               | 0662057A59           | Chip Res 2700 Ohms             |
| R3206-3207          | 0662057A09           | Chip Res 22 Ohms               |
| R3208               | 0662057A69           | Chip Res 6800 Ohms             |
| R3209               | 0611079A01           | O ohms, ±5%; 1/10 W            |
| R3210               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3211               | 0662057A59           | Chip Res 2700 Ohms             |
| R3212               | 0662057A41           | Chip Res 470 Ohms              |
| R3213               | 0662057A59           | Chip Res 2700 Ohms             |
| R3214               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3215               | 0662057A59           | Chip Res 2700 Ohms             |
| R3216               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3217               | 0662057A35           | Chip Res 270 Ohms              |
| R3218-3219          | 0662057A89           | Chip Res 47K Ohms              |
| R3220               | 0611079A01           | O ohms, ±5%; 1/10 W            |
| R3221               | 0662057A01           | Chip Res 10 Ohms               |
| R3222               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3223               | 0662057A09           | Chip Res 22 Ohms               |
| R3224               | 0662057A13           | Chip Res 33 Ohms               |
| R3225               | 0662057A83           | Chip Res 27K Ohms              |
| R3226               | 0662057A57           | Chip Res 2200 Ohms             |
| R3227               | 0662057A49           | Chip Res 1000 Ohms             |
| R3228               | 0662057A25           | Chip Res 100 Ohms              |
| R3229-3230          | 0662057A89           | Chip Res 47K Ohms              |
| R3231               | 0662057A19           | Chip Res 56 Ohms               |
| R3232               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3234               | 0662057A13           | Chip Res 33 Ohms               |
| R3235               | 0662057A83           | Chip Res 27K Ohms              |
| R3236               | 0662057A49           | Chip Res 1000 Ohms             |
| R3237               | 0662057A57           | Chip Res 2200 Ohms             |
| R3238               | 0662057A25           | Chip Res 100 Ohms              |
| R3239               | 0662057A09           | Chip Res 22 Ohms               |
| R3240               | 0662057A33           | Chip Res 220 Ohms              |
| R3401               | 0662057A99           | Chip Res 120K Ohms             |
| R3402               | 0662057A17           | Chip Res 47 Ohms               |
| R3404               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3405               | 0662057A57           | Chip Res 2200 Ohms             |
| R3406               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3407               | 0662057A49           | Chip Res 1000 Ohms             |
| R3409               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3410-3411          | 0662057A57           | Chip Res 2200 Ohms             |
| R3412               | 0662057A41           | Chip Res 470 Ohms              |
| R3413               | 0662057A85           | Chip Res 33K Ohms              |
| R3414               | 0662057P10           | Chip Res 10K Ohms 1%           |
| R3415               | 0662057A49           | Chip Res 1000 Ohms             |
| R3416               | 0662057A17           | Chip Res 47 Ohms               |
| R3417               | 0662057A99           | Chip Res 120K Ohms             |
| R3418               | 0662057A47           | Chip Res 820 Ohms              |
| R3419               | 0662057A25           | Chip Res 100 Ohms              |
| R3420               | 0662057A11           | Chip Res 27 Ohms               |
| R3421               | 0662057A49           | Chip Res 1000 Ohms             |

68P81094E12-D

Parts List (Sheet 14 of 14)

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TTD6301C Exciter Module (136 to 174MHz)

| REFERENCE<br>SYMBOL | MOTOROLA<br>PART NO. | DESCRIPTION          |
|---------------------|----------------------|----------------------|
| R3422-3423          | 0662057A81           | Chip Res 22K Ohms    |
| R3424-3427          | 0662057P10           | Chip Res 10K Ohms 1% |
| R3428               | 0662057A49           | Chip Res 1000 Ohms   |
| R3429               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3430               | 0662057A25           | Chip Res 100 Ohms    |
| R3431               | 0662057A57           | Chip Res 2200 Ohms   |
| R3432               | 0662057A89           | Chip Res 47K Ohms    |
| R3433               | 0662057A57           | Chip Res 2200 Ohms   |
| R3434               | 0662057A33           | Chip Res 220 Ohms    |
| R3435               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3436               | 0662057A33           | Chip Res 220 Ohms    |
| R3437-3438          | 0662057A63           | Chip Res 3900 Ohms   |
| R3439-3440          | 0662057A09           | Chip Res 22 Ohms     |
| R3441-3442          | 0662057P10           | Chip Res 10K Ohms 1% |
| R3443               | 0662057A63           | Chip Res 3900 Ohms   |
| R3444               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3445               | 0662057A43           | Chip Res 560 Ohms    |
| R3446               | 0662057A69           | Chip Res 6800 Ohms   |
| R3447-3449          | 0662057P10           | Chip Res 10K Ohms 1% |
| R3450               | 0662057A89           | Chip Res 47K Ohms    |
| R3451               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3452               | 0662057A67           | Chip Res 5600 Ohms   |
| R3453               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3454               | 0662057A61           | Chip Res 3300 Ohms   |
| R3455               | 0662057A67           | Chip Res 5600 Ohms   |
| R3456               | 0662057A75           | Chip Res 12K Ohms    |
| R3457               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3458               | 0662057A69           | Chip Res 6800 Ohms   |
| R3459               | 0662057A65           | Chip Res 4700 Ohms   |
| R3460               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3461               | 0662057A37           | Chip Res 330 Ohms    |
| R3462               | 0662057A43           | Chip Res 560 Ohms    |
| R3464               | 0662057A37           | Chip Res 330 Ohms    |
| R3466-3467          | 0611079A01           | O ohms, ±5%; 1/10 W  |
| R3469-3470          | 0611079A01           | O ohms, ±5%; 1/10 W  |
| R3471               | 0662057A97           | Chip Res 100K Ohms   |
| R3500               | 0662057A69           | Chip Res 6800 Ohms   |
| R3501               | 0662057A65           | Chip Res 4700 Ohms   |
| R3502               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3503               | 0662057A67           | Chip Res 5600 Ohms   |
| R3504               | 0662057P10           | Chip Res 10K Ohms 1% |
| R3505-3506          | 0662057A61           | Chip Res 3300 Ohms   |
| R3507-509           | 0662057P10           | Chip Res 10K Ohms 1% |
| R3510               | 0662057A79           | Chip Res 18K Ohms    |

INTEGRATED CIRCUIT: (SEE NOTE)

|       |            |                                      |
|-------|------------|--------------------------------------|
| U3000 | 5113819A05 | High Performance, Single Supply      |
| U3303 | 5113816A07 | 5-Volt Positive Regulator            |
| U3401 | 5113819A05 | High Performance, Single Supply      |
| U3402 | 5184602T04 | IC Synthesizer Speed Screened        |
| U3403 | 5113806A21 | Quad Analog Switch Multiplexer       |
| U3404 | 5183077Y01 | High Speed Quad Amp SO14             |
| U3405 | 5113805A18 | Dual D-Type Flip-Flop with Set/Reset |
| U3500 | 5182374Y01 | IC A/D 8 BIT                         |

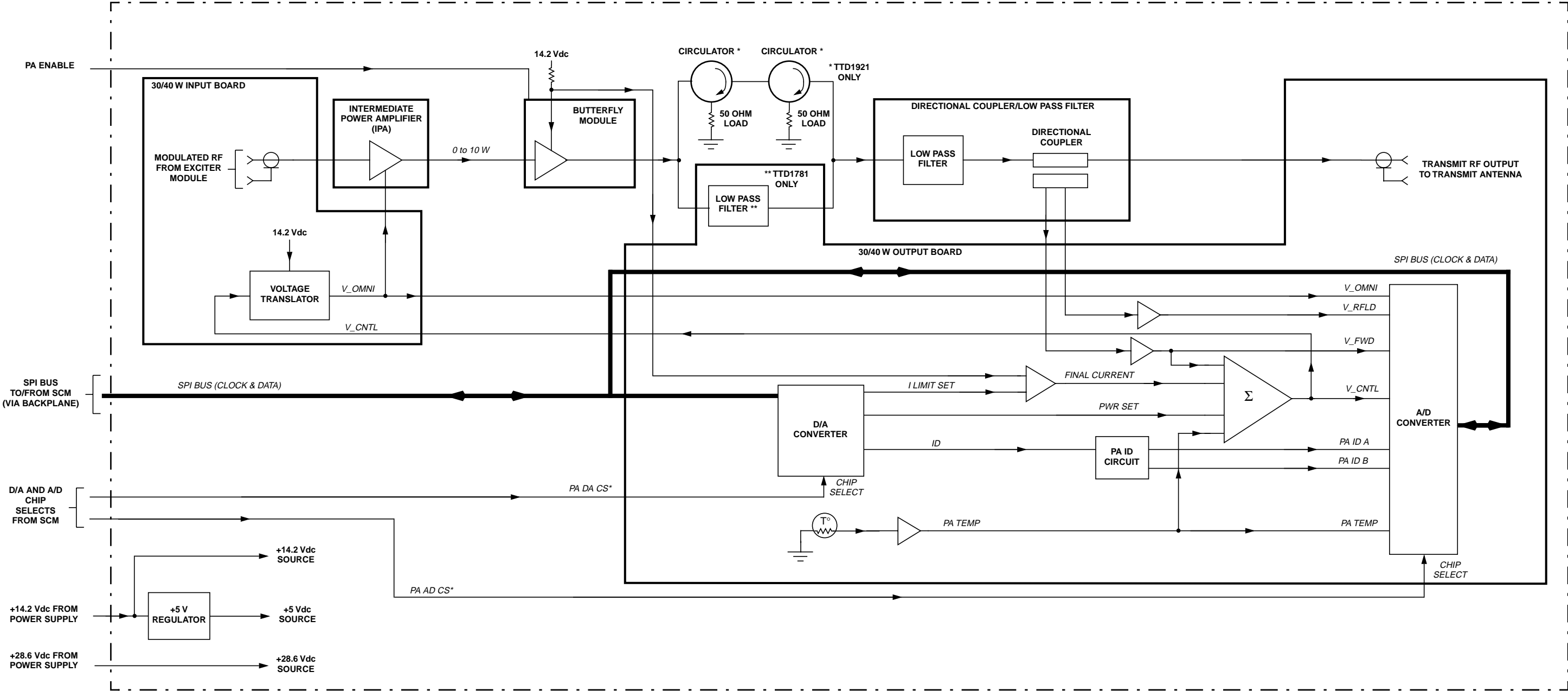
NON-REFERENCED ITEMS

|            |                          |
|------------|--------------------------|
| 5482006W01 | Label, PCB barcode       |
| 5482006W02 | ribbon, thermal transfer |
| 5484960T02 | LABEL BLANK BARCODE      |

**Note:** For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part number.

30/40W PA MODULE  
MODEL TTD1921A/TTD1781A

|                  | TTD1781<br>40 W | TTD1921<br>30 W |
|------------------|-----------------|-----------------|
| IPA              | TLD9820         |                 |
| Butterfly Module | TTD6370         |                 |
| Coupler/LPF      | TFD6560         |                 |
| Input Board      | TTD6470         |                 |
| Output Board     | TTD6451         | TTD6481         |
| Circulator       |                 | 5884911T20      |

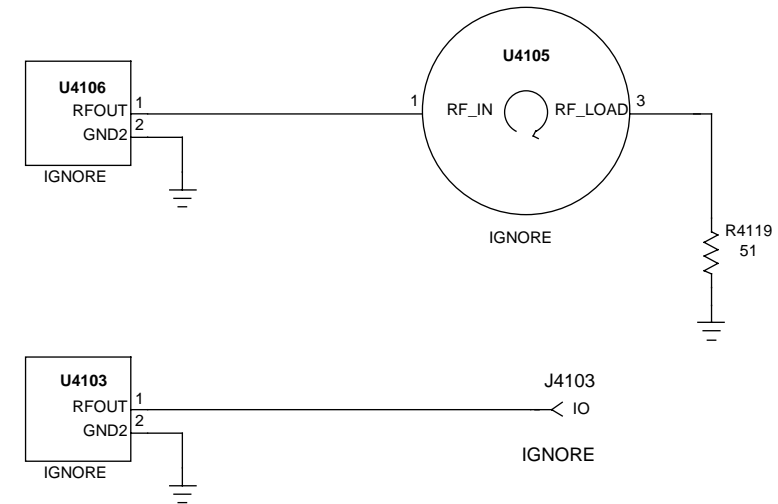


30/40W PA FUNCTIONAL BLOCK DIAGRAM

**30/40W PA MODULE**  
**MODEL TTD1921A/TTD1781A**

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## TTD6470B 30/40W INPUT BOARD



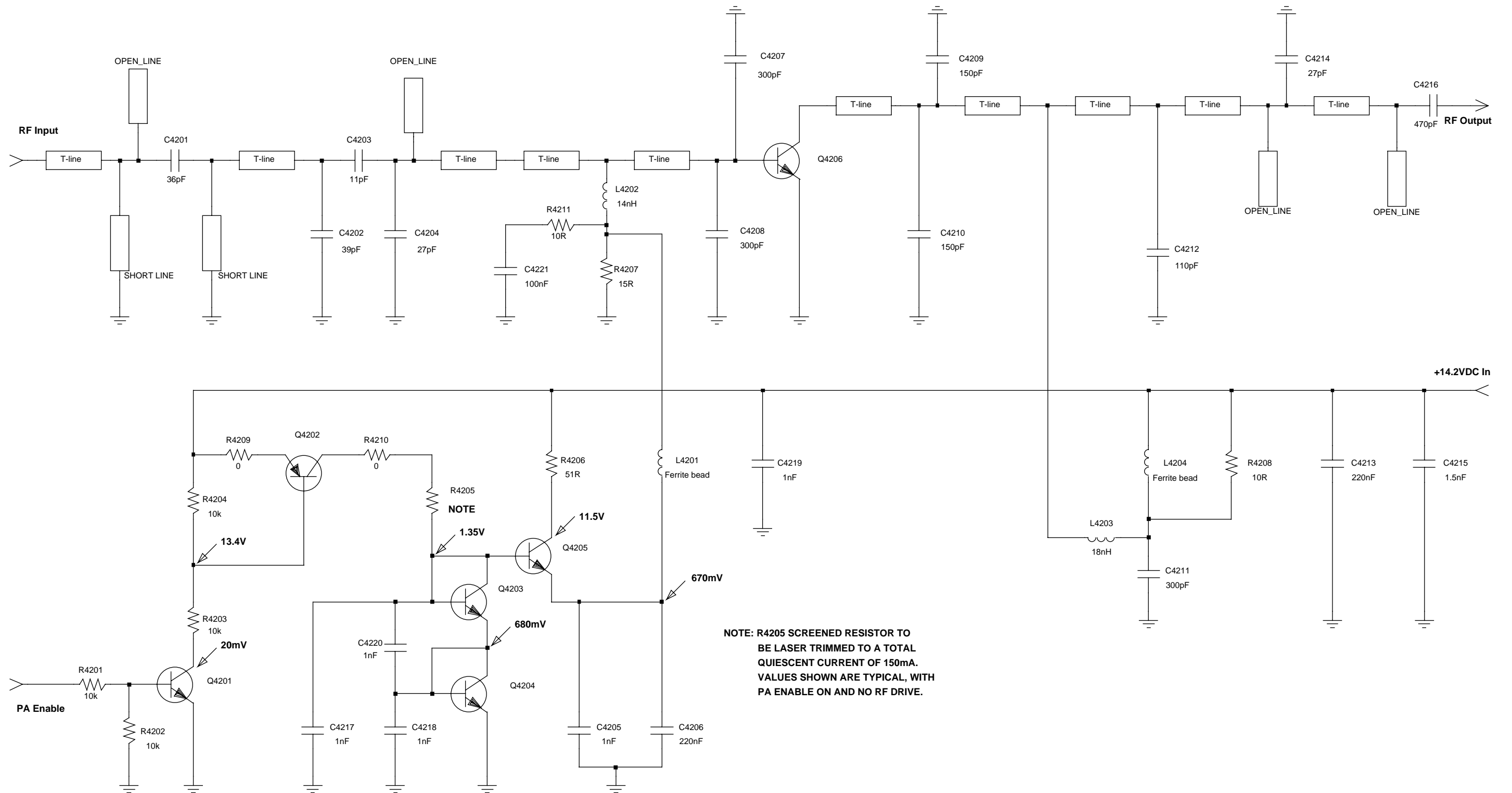
| Signal Path | Description/Nominal Signal Levels   |
|-------------|-------------------------------------|
| Ⓐ           | Zero output: 0V<br>30/40W: typ 5V   |
| Ⓑ           | Zero output: 0V<br>30/40W: typ 5.5V |
| Ⓒ           | Bias off: 0V<br>Bias on: 5V         |

**30/40W PA MODULE**  
**MODEL TTD1921A/TTD1781A**

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# 30/40W PA MODULE

## MODEL TTD1921A/TTD1781A



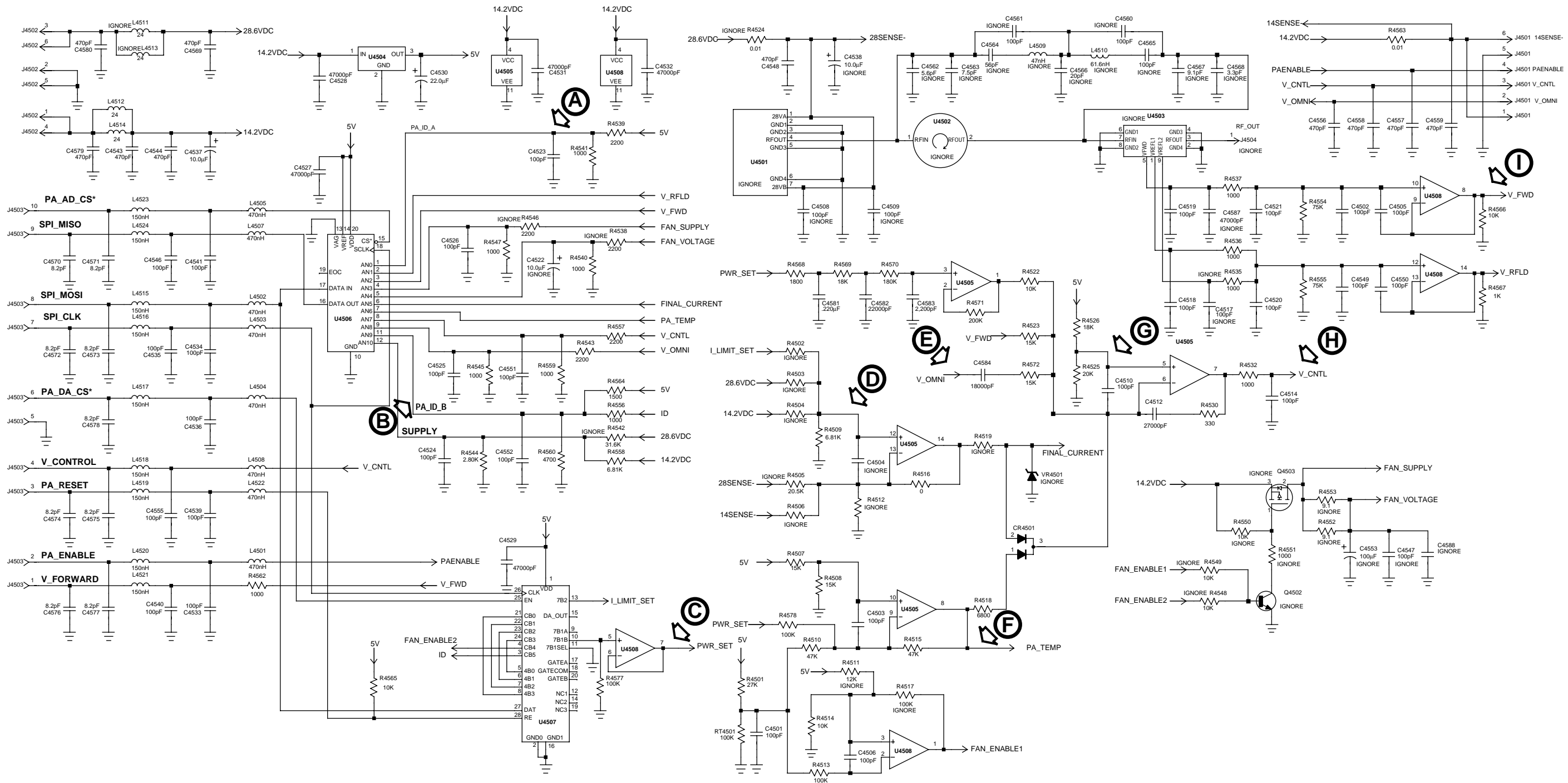
## TTD6370A 30/40W BUTTERFLY MODULE

30/40W PA MODULE  
MODEL TTD1921A/TTD1781A

TTD6481

| Signal Path | Description/Nominal Signal Levels                           |
|-------------|---|
| Ⓐ           | 1.56V typ   |
| Ⓑ           | 1.88V @ID_B=0<br>3.75V @ID_B=1                              |
| Ⓒ           | 4.6V typ @ Zero Output power<br>2.4V typ @ 30W Output power |
| Ⓓ           | 4.13V typ   |
| Ⓔ           | Zero output: 0V<br>5.3V typ @ 30W Output                    |
| Ⓕ           | Zero output: 0V<br>5.3V typ @ 30W Output                    |
| Ⓖ           | 2.63V typ   |
| Ⓗ           | Zero output: 0V<br>4.8V typ @ 30W Output                    |
| Ⓘ           | 2.9V typ @30W Output  |

30/40W PA MODULE  
MODEL TTD1921A/TTD1781A



TTD6481B 30W OUTPUT BOARD



30/40W PA MODULE  
MODEL TTD1921A/TTD1781A

TTD6451

| Signal Path | Description/Nominal Signal Levels                           |
|-------------|---|
| Ⓐ           | 1.56V typ   |
| Ⓑ           | 1.25V @ID_B=0<br>3.75V @ID_B=1                              |
| Ⓒ           | 4.6V typ @ Zero Output power<br>2.2V typ @ 40W Output power |
| Ⓓ           | 4.13V typ   |
| Ⓔ           | Zero output: 0V<br>5.5V typ @ 40W Output                    |
| Ⓕ           | Zero output: 0V<br>5.5V typ @ 40W Output                    |
| Ⓖ           | 2.63V typ   |
| Ⓗ           | Zero output: 0V<br>5.0V typ @ 40W Output                    |
| Ⓘ           | 3.4V typ @40W Output  |

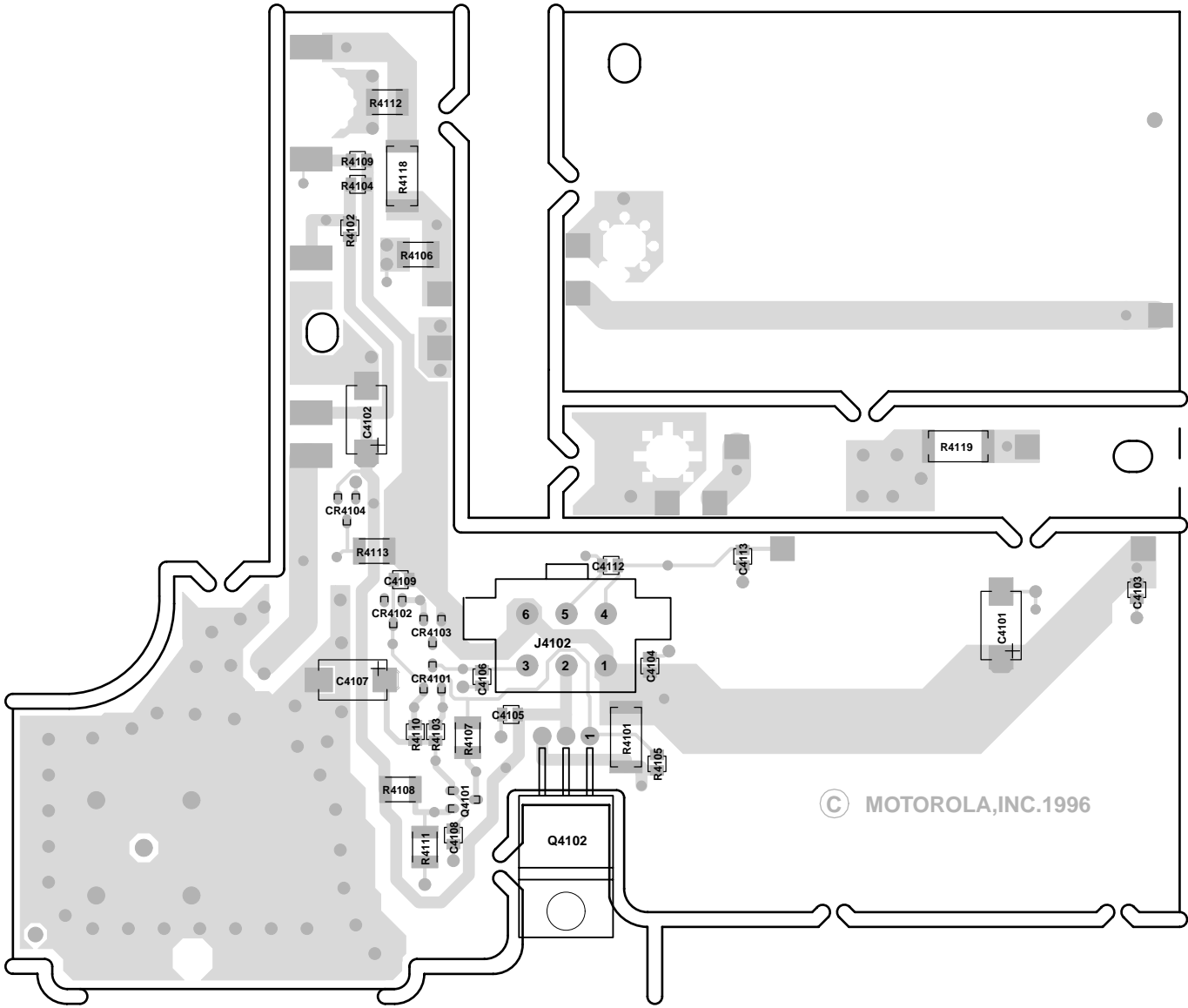
## TTD6451A 40W OUTPUT BOARD

68P81094E14-C  
Schematics (Sheet 9 of 18)  
03/26/99

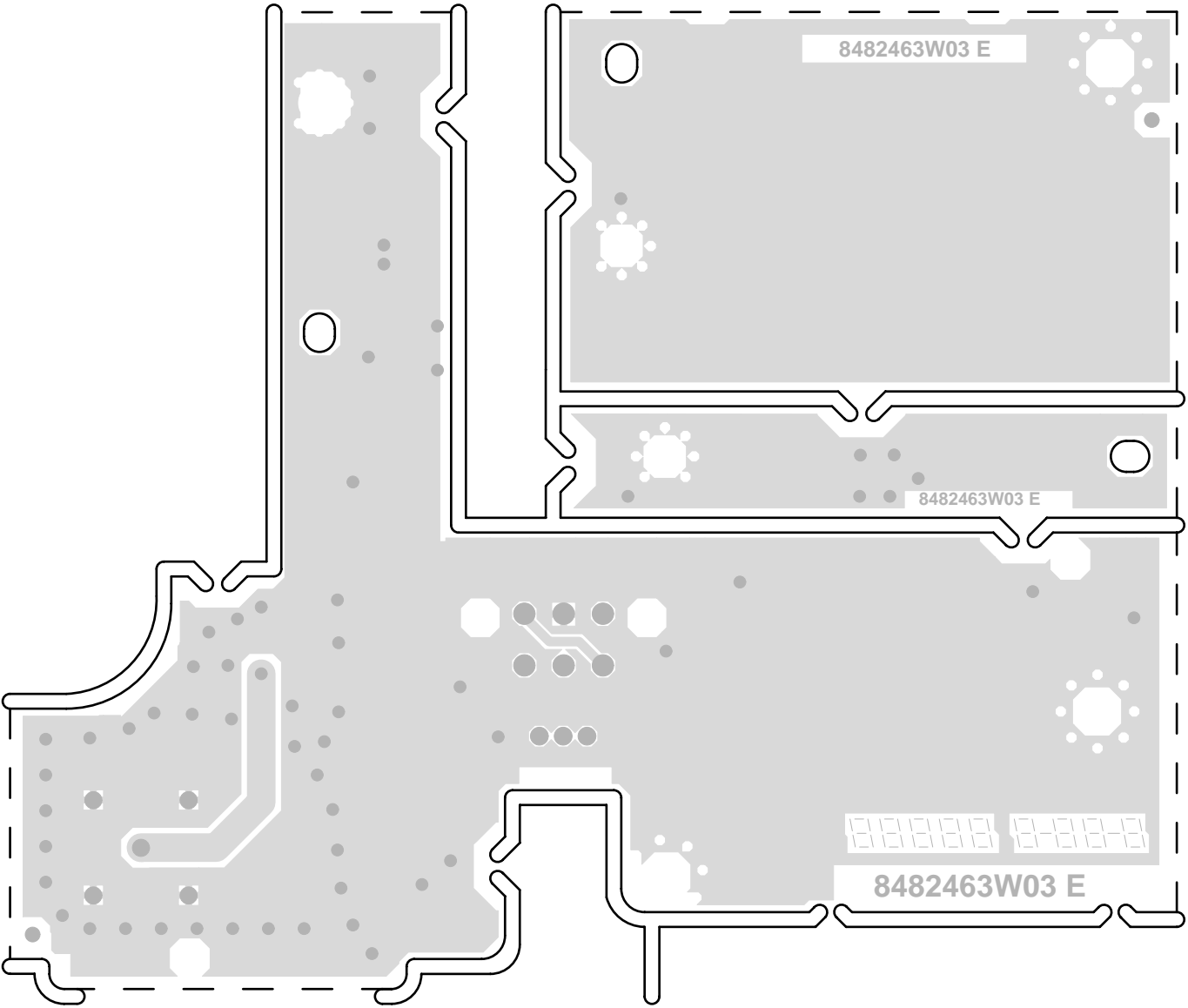
**30/40W PA MODULE**  
**MODEL TTD1921A/TTD1781A**

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**30/40W PA MODULE**  
**MODEL TTD1921A/TTD1781A**



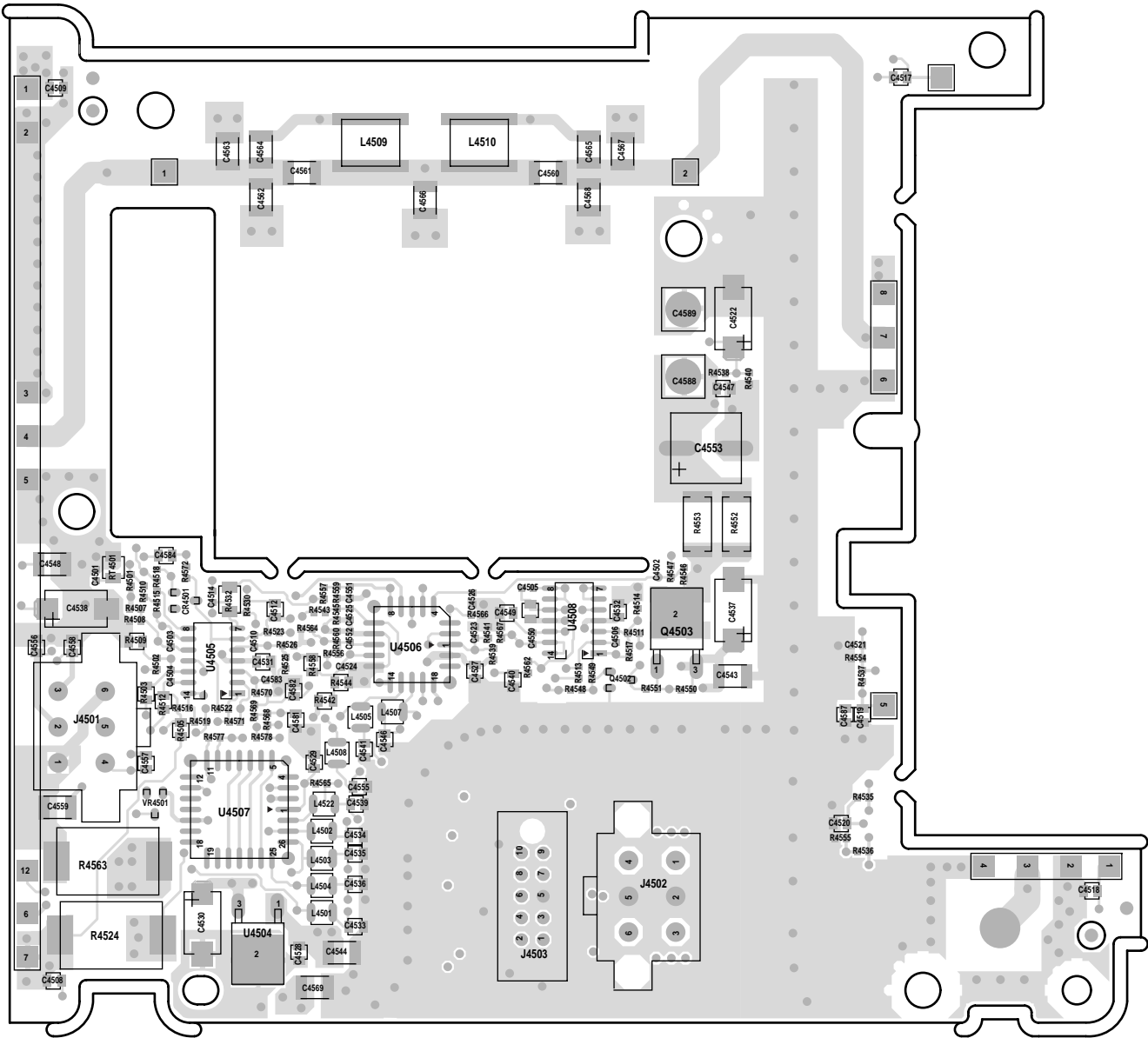
**TTD6470B INPUT BOARD DETAIL HEAVY COMPONENT SIDE**



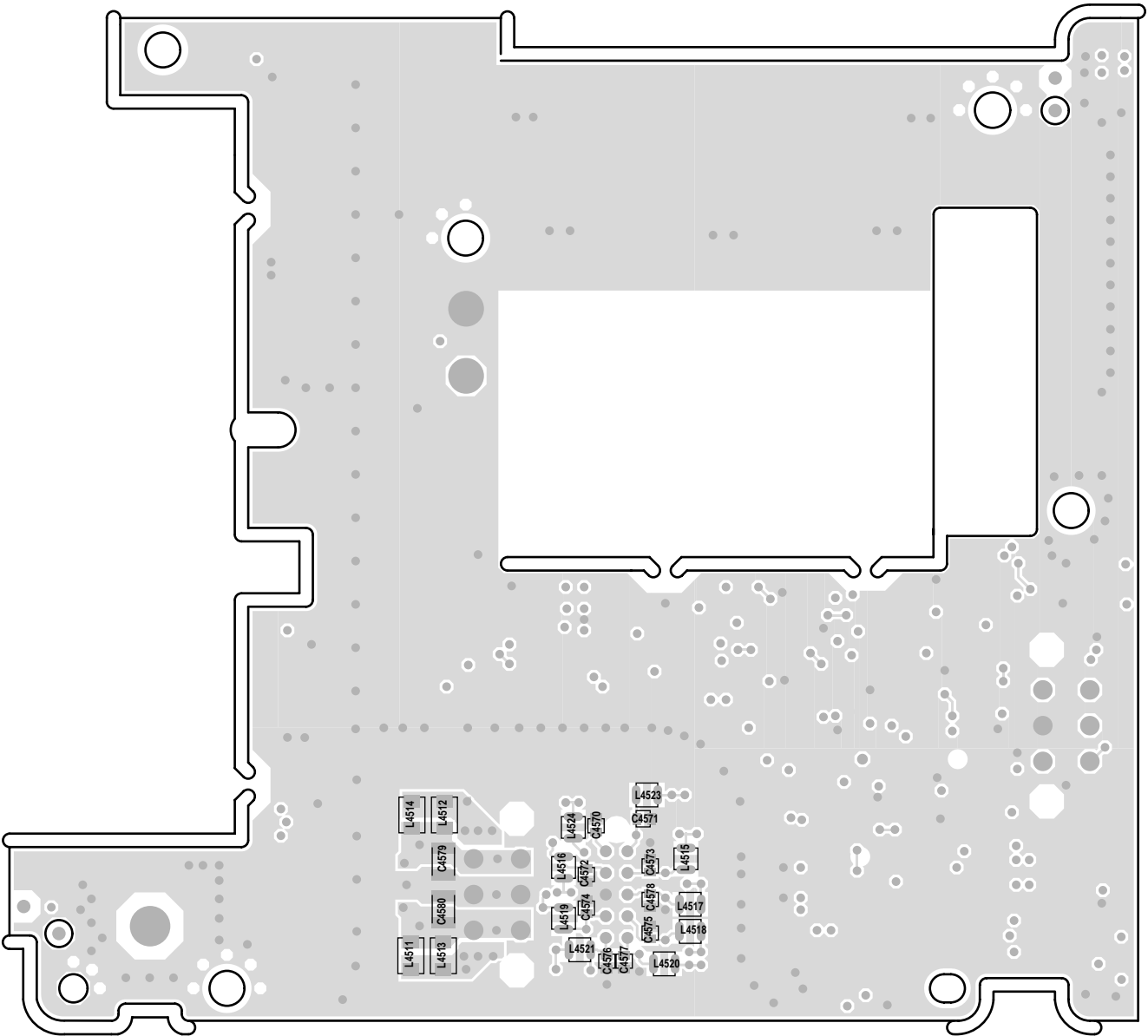
**TTD6470B INPUT BOARD DETAIL LIGHT COMPONENT SIDE**

**TTD1781A,TTD1921A 30/40W PA BOARD DETAIL**

30/40W PA MODULE  
MODEL TTD1921A/TTD1781A



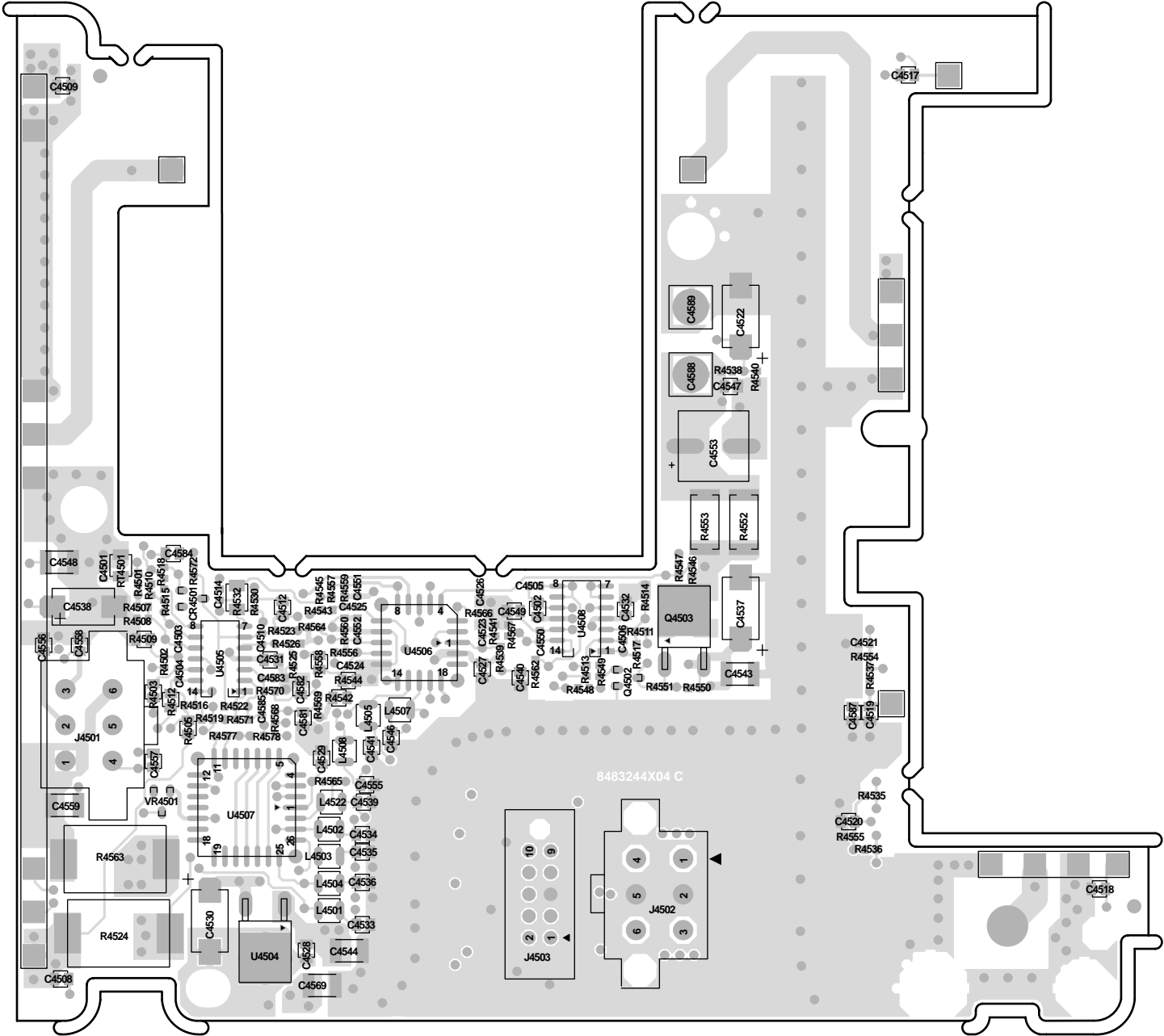
TTD6451A 30W OUTPUT BOARD DETAIL HEAVY COMPONENT SIDE



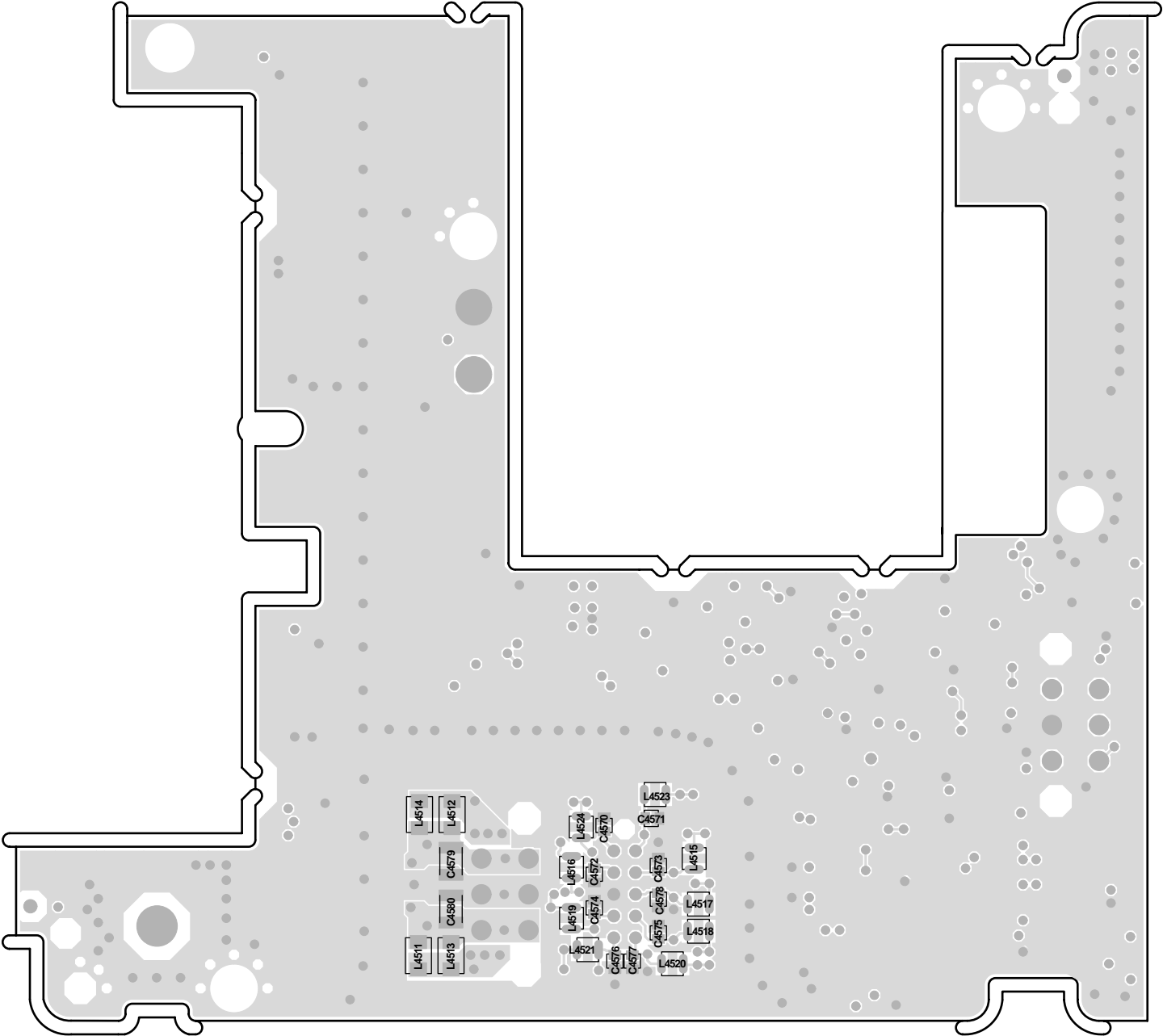
TTD6451A 30W OUTPUT BOARD DETAIL LIGHT COMPONENT SIDE

TTD1781A 30W PA BOARD DETAIL

30/40W PA MODULE  
MODEL TTD1921A/TTD1781A



TTD6481B 40W OUTPUT BOARD DETAIL HEAVY COMPONENT SIDE



TTD6481B 40W OUTPUT BOARD DETAIL LIGHT COMPONENT SIDE

TTD1921A 40W PA BOARD DETAIL

**30/40W PA MODULE**  
**MODEL TTD1921A/TTD1781A**

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# Parts List

## TTD1921A 30W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL   | MOTOROLA PART NO. | DESCRIPTION                             |
|--|-------------------|---|
| <b>CAPACITOR, FIXED: <math>\mu\text{F} \pm 10\%</math>; 100 V:</b> |                   |   |
| UNLESS OTHERWISE STATED  |                   |   |
| C4000,4001   | 2183785X03        | Cap Mica 7pF .5% 250V                   |
| C4002  | 2183785X07        | Cap Mica 25pF 5% 250V                   |
| C4003  | 2183785X03        | Cap Mica 7pF .5% 250V                   |
| C4004  | 2183785X07        | Cap Mica 25pF 5% 250V                   |
| C4005  | 2183785X03        | Cap Mica 7pF .5% 250V                   |
| C4006  | 2183785X04        | Cap Mica 10pF 5% 250V                   |
| C4008  | 2113740B49        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4010  | 2113740B49        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4101,4102   | 2311049A45        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 35 V    |
| C4103 thru 4106  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                |
| C4108  | 2113741A21        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4109  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                |
| C4112,4113   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                |
| C4201  | 2113901C47        | Cap ChipHI Q 36 pF $\pm 5\%$            |
| C4202  | 2113901C48        | Cap ChipHI Q 39 pF $\pm 5\%$            |
| C4203  | 2113901C30        | Cap ChipHI Q 11 pF $\pm 5\%$            |
| C4204  | 2113901C41        | Cap ChipHI Q 27 pF $\pm 5\%$            |
| C4205  | 2113741A21        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4206  | 2113743A23        | Cap Chip.220 $\mu\text{F}$ 10% X7R      |
| C4207,4208   | 2113901C70        | Cap ChipHI Q 300 pF $\pm 5\%$           |
| C4209,4210   | 2113901C63        | Cap ChipHI Q 150 pF $\pm 5\%$           |
| C4211  | 2113901C70        | Cap ChipHI Q 300 pF $\pm 5\%$           |
| C4212  | 2113901C59        | Cap ChipHI Q 110 pF $\pm 5\%$           |
| C4213  | 2113741D28        | 0.22 $\mu\text{F}$ , $\pm 5\%$ ; 50V    |
| C4214  | 2113901C41        | Cap ChipHI Q 27 pF $\pm 5\%$            |
| C4215  | 2113740B76        | 1500 pF, $\pm 5\%$ ; 50 V               |
| C4216  | 2113901C75        | Cap ChipHI Q 470 pF $\pm 5\%$           |
| C4217  | 2113741B21        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4218 thru 4220  | 2113741A21        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4221  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V    |
| C4400,4401   | 2113740B73        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4402  | 2113740B25        | 10 pF, $\pm 5\%$ ; 50 V                 |
| C4403  | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V    |
| C4404  | 2113740B73        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4405  | 2113740B41        | 47 pF, $\pm 5\%$ ; 50 V                 |
| C4406  | 2113740B52        | 130 pF, $\pm 5\%$ ; 50 V                |
| C4407  | 2113740B51        | 120 pF, $\pm 5\%$ ; 50 V                |
| C4408  | 2113740B76        | 1500 pF, $\pm 5\%$ ; 50 V               |
| C4409  | 2113740B78        | 1800 pF, $\pm 5\%$ ; 50 V               |
| C4410  | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V    |
| C4411  | 2113901C59        | Cap ChipHI Q 110 pF $\pm 5\%$           |
| C4412  | 2113740B39        | 39 pF, $\pm 5\%$ ; 50 V                 |
| C4413  | 2113740B73        | 1000 pF, $\pm 5\%$ ; 50 V               |
| C4501  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4502  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4503  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4505,4506   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4510  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4512  | 2113741A55        | 0.027 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C4514  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4518 thru 4520  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4521  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4523 thru 4526  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4527 thru 4529  | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C4530  | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V    |
| C4531,4532   | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C4533 thru 4536  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4537  | 2311049A45        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 35 V    |
| C4539 thru 4541  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4543,4544   | 2113901C75        | Cap ChipHI Q 470 pF $\pm 5\%$           |
| C4546  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4548  | 2113901C75        | Cap ChipHI Q 470 pF $\pm 5\%$           |
| C4549  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4550 thru 4552  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| C4555  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                |
| C4556 thru 4558  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                |
| C4559  | 2113901C75        | Cap ChipHI Q 470 pF $\pm 5\%$           |
| C4569  | 2113901C75        | Cap ChipHI Q 470 pF $\pm 5\%$           |
| C4570 thru 4578  | 2113901A27        | Cap ChipHI Q 8.2 pF $\pm 0.50\text{pF}$ |
| C4579,4580   | 2113901C75        | Cap ChipHI Q 470 pF $\pm 5\%$           |
| C4581  | 2113743A23        | Cap Chip.220 $\mu\text{F}$ 10% X7R      |
| C4582  | 2113741A53        | 0.022 $\mu\text{F}$ , $\pm 5\%$ ; 50 V  |
| C4583  | 2113741F33        | 2200 pF, $\pm 5\%$ ; 50V                |
| C4584  | 2113741A51        | 0.018 $\mu\text{F}$ , $\pm 5\%$ ; 50V   |
| C4585  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                 |
| <b>DIODE: (SEE NOTE)</b>   |                   |   |
| CR4000,4001  | 4882290T04        | Diode; hot carrier                      |
| CR4101 thru 4103   | 4813833C05        | dual 70 V                               |

## TTD1921A 30W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL                                      | MOTOROLA PART NO. | DESCRIPTION                    |
|---|-------------------|--------------------------------|
| CR4104  | 4813833C03        | dual 70V                       |
| CR4400  | 4813833C05        | dual 70 V                      |
| CR4501  | 4813833C02        | Dual diode; common cathode     |
| <b>CONNECTOR, RECEPTACLE:</b>                         |                   |                                |
| J4101   | 0982492W01        | BNC CONN PCB VERTICAL RECEPT   |
| J4102   | 2884490T03        | HDR 2X3 VERT PWR               |
| J4501,4502  | 2884490T03        | HDR 2X3 VERT PWR               |
| <b>CONNECTOR, PLUG:</b>                               |                   |                                |
| J4503   | 2885155U01        | plug, 10-contact               |
| <b>COIL, INDUCTOR:</b>                                |                   |                                |
| L4000 thru 4002                                       | 2483035N64        | COIL; airwound 12 awg; 3-turns |
| L4003   | 2411087A20        | 0.33 uH                        |
| L4004   | 2411087A22        | COIL; chip .47 uH              |
| L4005   | 2411087A02        | 0.010 uH                       |
| L4006   | 2411087A20        | 0.33 uH                        |
| L4007   | 2411087A22        | COIL; chip .47 uH              |
| L4008   | 2460591A49        | COIL; airwound 8.01            |
| L4201   | 2484657R01        | ferrite bead                   |
| L4202   | 2460591C23        | COIL AIR WOUND INDUC 13.85     |
| L4203   | 2460591X01        | COIL AIR WOUND SQUARE 21 NH    |
| L4204   | 2484657R01        | ferrite bead                   |
| L4400   | 2411087A07        | 0.027 uH                       |
| L4401   | 2484657R01        | ferrite bead                   |
| L4402   | 2411087A13        | .082 UH                        |
| L4403   | 2411087A04        | 0.015 uH                       |
| L4404,4405  | 2484657R01        | ferrite bead                   |
| L4406   | 2411087A04        | 0.015 uH                       |
| L4407   | 2484331M10        | COIL, airwound 22 awg; 4-turns |
| L4501 thru 4505                                       | 2462587X61        | IND CHIP LO-PRO 470 NH 5%      |
| L4507,4508  | 2462587X61        | IND CHIP LO-PRO 470 NH 5%      |
| L4512   | 2484657R01        | ferrite bead                   |
| L4514   | 2484657R01        | ferrite bead                   |
| L4515 thru 4521                                       | 2462587X55        | IND CHIP LO-PRO 150 NH 5%      |
| L4522   | 2462587X61        | IND CHIP LO-PRO 470 NH 5%      |
| L4523,4524  | 2462587X55        | IND CHIP LO-PRO 150 NH 5%      |
| <b>TRANSISTOR: (SEE NOTE)</b>                         |                   |                                |
| Q4101   | 4813824A10        | NPN                            |
| Q4102   | 4813822D08        | Transistor; 100 V              |
| Q4201   | 4813824A11        | NPN                            |
| Q4202   | 4813824A17        | PNP                            |
| Q4203,4204  | 4813824A11        | NPN                            |
| Q4205   | 4813824B01        | TSTR NPN 40V GEN PURP 2222AT1  |
| Q4206   | 4884411L04        | TSTR M1104                     |
| Q4400   | 4813827A26        | Transistor; NPN                |
| Q4401   | 4882233P54        | Transistor; NPN                |
| <b>RESISTOR, FIXED: <math>\pm 5\%</math>; 1/16 W:</b> |                   |                                |
| UNLESS OTHERWISE STATED                               |                   |                                |
| R4101   | 0683962T01        | 1 Ohm, $\pm 5\%$ ; 1 W         |
| R4103   | 0611079A60        | 270 Ohms, $\pm 5\%$ ; 1/10 W   |
| R4104   | 0611079A01        | 0 Ohms, $\pm 5\%$ ; 1/10 W     |
| R4105   | 0611079A98        | 10K, $\pm 5\%$ ; 1/10 W        |
| R4106   | 0611072A53        | 1.5K, $\pm 5\%$ ; 1/4W         |
| R4107   | 0611072A49        | 1K, $\pm 5\%$ ; 1/4 W          |
| R4108   | 0611072A37        | 330 1/4 W                      |
| R4110   | 0611079A60        | 270 Ohms, $\pm 5\%$ ; 1/10 W   |
| R4111   | 0611072A49        | 1K, $\pm 5\%$ ; 1/4 W          |
| R4112   | 0611072A53        | 1.5K, $\pm 5\%$ ; 1/4W         |
| R4113   | 0611072A49        | 1K, $\pm 5\%$ ; 1/4 W          |
| R4118   | 0683962T13        | 3.3 Ohms, $\pm 5\%$ ; 1W       |
| R4119   | 0683962T42        | 51 Ohms, $\pm 5\%$ ; 1 W       |
| R4201 thru 4204                                       | 0611077A98        | 10K, $\pm 5\%$ ; 1/8 W         |
| R4206   | 0683962T42        | 51 Ohms, $\pm 5\%$ ; 1 W       |
| R4207   | 0611077A30        | 15 Ohms, $\pm 5\%$ ; 1/8 W     |
| R4208   | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W     |
| R4209,4210  | 0611077A01        | 0 Ohm, $\pm 5\%$ ; 0 W         |
| R4211   | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W     |
| R4400,4401  | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W     |
| R4402   | 0611077A90        | 4.7K, $\pm 5\%$ ; 1/8 W        |
| R4403,4404  | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W     |
| R4405   | 0611077A12        | 2.7 Ohms, $\pm 5\%$ ; 1/8 W    |
| R4406,4407  | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W     |
| R4501   | 0662057A83        | Chip Res 27K Ohms              |
| R4507,4508  | 0662057A77        | Chip Res 15K Ohms              |
| R4509   | 0611079F81        | Chip Res6.81K 1/10W 1% 0805    |
| R4510   | 0662057A89        | Chip Res 47K Ohms              |
| R4513   | 0662057A97        | Chip Res 100K Ohms             |

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TTD1921A 30W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                                  |
|---------------------------------------|-------------------|--|
| R4514                                 | 0662057A73        | Chip Res 10K Ohms                            |
| R4515                                 | 0662057A89        | Chip Res 47K Ohms                            |
| R4516                                 | 0662057B47        | Chip Res 0 Ohms +/-0.050 Ohms                |
| R4518                                 | 0662057A69        | Chip Res 6800 Ohms                           |
| R4522                                 | 0662057A73        | Chip Res 10K Ohms                            |
| R4523                                 | 0662057A77        | Chip Res 15K Ohms                            |
| R4525                                 | 0662057A80        | Chip Res 20K Ohms                            |
| R4526                                 | 0662057A79        | Chip Res 18K Ohms                            |
| R4530                                 | 0662057A37        | Chip Res 330 Ohms                            |
| R4532                                 | 0611077A74        | 1K, ±5%; 1/8 W                               |
| R4536,4537                            | 0662057A49        | Chip Res 1000 Ohms                           |
| R4539                                 | 0662057A57        | Chip Res 2200 Ohms                           |
| R4540,4541                            | 0662057A49        | Chip Res 1000 Ohms                           |
| R4543                                 | 0662057A57        | Chip Res 2200 Ohms                           |
| R4544                                 | 0611079F44        | Chip Res2.80K 1/10W 1% 0805                  |
| R4545                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4547                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4554,4555                            | 0662057A94        | Chip Res 75K Ohms                            |
| R4556                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4557                                 | 0662057A57        | Chip Res 2200 Ohms                           |
| R4558                                 | 0611079F81        | Chip Res6.81K 1/10W 1% 0805                  |
| R4559                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4560                                 | 0662057A65        | Chip Res 4700 Ohms                           |
| R4562                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4563                                 | 0682089V01        | SMT .01 2W                                   |
| R4564                                 | 0662057A53        | Chip Res 1500 Ohms                           |
| R4565,4566                            | 0662057A73        | Chip Res 10K Ohms                            |
| R4567                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4568                                 | 0662057A55        | Chip Res 1800 Ohms                           |
| R4569                                 | 0662057A79        | Chip Res 18K Ohms                            |
| R4570                                 | 0662057A49        | Chip Res 1000 Ohms                           |
| R4571                                 | 0662057B05        | Chip Res 200K Ohms                           |
| R4572                                 | 0662057A77        | Chip Res 15K Ohms                            |
| R4577,4578                            | 0662057A97        | Chip Res 100K Ohms                           |
| <b>THERMISTOR:</b>                    |                   |  |
| RT4501                                | 0680149M02        | 100 k, ±10%; 240 mW                          |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |  |
| U4504                                 | 5113816A07        | 5-Volt Positive Regulator                    |
| U4505                                 | 5113819A05        | High Performance, Single Supply              |
| U4506                                 | 5182374Y01        | IC A/D 8 BIT                                 |
| U4507                                 | 5180057S02        | IC CMOS CUST DA CONV 13" REEL                |
| U4508                                 | 5113819A05        | High Performance, Single Supply              |
| <b>CABLE ASSEMBLY:</b>                |                   |  |
| W4000 thru 4007                       | 4280500F01        | T & R VER OF 4282981X01                      |
| W4201 thru 4206                       | 4280500F01        | T & R VER OF 4282981X01                      |
| W4207,4208                            | 4283431X01        | GROUND CLIP                                  |
| W4209,4210                            | 4284952P02        | 16 GAUGE 21.1MM                              |
| W4900                                 | 4280500F01        | T & R VER OF 4282981X01                      |
| <b>NON-REFERENCED ITEMS</b>           |                   |  |
| TFD6560A                              |                   | Lowpass Filter and Final Coupler             |
| THN6795A                              |                   | MODULE HOUSING PA LP W/CRCLTR                |
| TLD9820A                              |                   | RF OMNI Module                               |
| TTD6370A                              |                   | PA 50W MODULE                                |
| TTD6470B                              |                   | PA HIGH BAND 40W INPUT BD                    |
| TTD6481B                              |                   | PA HIGH BAND 30W OUTPUT BD R1                |
| TTN5238A                              |                   | CIRCULATOR LOAD                              |
| 0310907A19                            |                   | SCREW, machine: M3x0.5x8 (33 used)           |
| 0310907A40                            |                   | SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)      |
| 0383498N05                            |                   | SCREW, tapping: M4 x 0.7 x 12 (2 used)       |
| 0782106V01                            |                   | BRACKET; low pass filter                     |
| 0783544X01                            |                   | BRACKET, OMNI                                |
| 0900816159                            |                   | CONNECTOR, receptacle: coaxial               |
| 1582626X02                            |                   | COVER PA & PS CASTING                        |
| 2682624X06                            |                   | HEATSINK LOW POWER AMP                       |
| 3082728X05                            |                   | CBL 6-WIRE                                   |
| 3282170V01                            |                   | GASKET RF (56 used)                          |
| 4385035U02                            |                   | FLANGE circulator load (VHF)                 |
| 5482006W01                            |                   | Label, PCB barcode                           |
| 5483323X01                            |                   | LABEL, FREQ. REF.                            |
| 5484960T01                            |                   | Label, barcode: 6.3 x 12.7mm, white (2 used) |
| 5484960T02                            |                   | LABEL BLANK BARCODE (2 used)                 |
| 5884911T20                            |                   | Circulator; 150-174 MHz (2 used)             |
| 6482474V01                            |                   | PLATE  |
| 6483129N01                            |                   | PLATE, transistor mtg (2 used)               |

TTD1921A 30W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION |
|---|-------------------|-------------|
| <b>Note:</b> For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number. |                   |             |

# Parts List

## TTD1781A 40W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL   | MOTOROLA PART NO. | DESCRIPTION                              |
|--|-------------------|--|
| <b>CAPACITOR, FIXED: <math>\mu\text{F} \pm 10\%</math>; 100 V:</b> |                   |  |
| UNLESS OTHERWISE STATED  |                   |  |
| C4000,4001   | 2183785X03        | Cap Mica 7pF .5% 250V                    |
| C4002  | 2183785X07        | Cap Mica 25pF 5% 250V                    |
| C4003  | 2183785X03        | Cap Mica 7pF .5% 250V                    |
| C4004  | 2183785X07        | Cap Mica 25pF 5% 250V                    |
| C4005  | 2183785X03        | Cap Mica 7pF .5% 250V                    |
| C4006  | 2183785X04        | Cap Mica 10pF 5% 250V                    |
| C4008  | 2113740B49        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4010  | 2113740B49        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4101,4102   | 2311049A45        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 35 V     |
| C4103 thru 4106  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                 |
| C4108  | 2113741A21        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4109  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                 |
| C4112,4113   | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                 |
| C4201  | 2113901C47        | Cap Chip HI Q 36 pF $\pm 5\%$            |
| C4202  | 2113901C48        | Cap Chip HI Q 39 pF $\pm 5\%$            |
| C4203  | 2113901C30        | Cap Chip HI Q 11 pF $\pm 5\%$            |
| C4204  | 2113901C41        | Cap Chip HI Q 27 pF $\pm 5\%$            |
| C4205  | 2113741A21        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4206  | 2113743A23        | Cap Chip .220 UF 10% X7R                 |
| C4207,4208   | 2113901C70        | Cap Chip HI Q 300 pF $\pm 5\%$           |
| C4209,4210   | 2113901C63        | Cap Chip HI Q 150 pF $\pm 5\%$           |
| C4211  | 2113901C70        | Cap Chip HI Q 300 pF $\pm 5\%$           |
| C4212  | 2113901C59        | Cap Chip HI Q 110 pF $\pm 5\%$           |
| C4213  | 2113741D28        | 0.22 $\mu\text{F}$ , $\pm 5\%$ ; 50V     |
| C4214  | 2113901C41        | Cap Chip HI Q 27 pF $\pm 5\%$            |
| C4215  | 2113740B76        | 1500 pF, $\pm 5\%$ ; 50 V                |
| C4216  | 2113901C75        | Cap Chip HI Q 470 pF $\pm 5\%$           |
| C4217  | 2113741B21        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4218 thru 4220  | 2113741A21        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4221  | 2113743A19        | 0.1 $\mu\text{F}$ , $\pm 10\%$ ; 16V     |
| C4400,4401   | 2113740B73        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4402  | 2113740B25        | 10 pF, $\pm 5\%$ ; 50 V                  |
| C4403  | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V     |
| C4404  | 2113740B73        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4405  | 2113740B41        | 47 pF, $\pm 5\%$ ; 50 V                  |
| C4406  | 2113740B52        | 130 pF, $\pm 5\%$ ; 50 V                 |
| C4407  | 2113740B51        | 120 pF, $\pm 5\%$ ; 50 V                 |
| C4408  | 2113740B76        | 1500 pF, $\pm 5\%$ ; 50 V                |
| C4409  | 2113740B78        | 1800 pF, $\pm 5\%$ ; 50 V                |
| C4410  | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V     |
| C4411  | 2113901C59        | Cap Chip HI Q 110 pF $\pm 5\%$           |
| C4412  | 2113740B39        | 39 pF, $\pm 5\%$ ; 50 V                  |
| C4413  | 2113740B73        | 1000 pF, $\pm 5\%$ ; 50 V                |
| C4501  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4502  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4503  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4505,4506   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4510  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4512  | 2113741A55        | 0.027 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C4514  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4518 thru 4520  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4521  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4523 thru 4526  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4527 thru 4529  | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C4530  | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V     |
| C4531,4532   | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C4533 thru 4536  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4537  | 2311049A45        | 10 $\mu\text{F}$ , $\pm 10\%$ ; 35 V     |
| C4539 thru 4541  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4543,4544   | 2113901C75        | Cap Chip HI Q 470 pF $\pm 5\%$           |
| C4546  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4548  | 2113901C75        | Cap Chip HI Q 470 pF $\pm 5\%$           |
| C4549  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4550 thru 4552  | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                  |
| C4555  | 2113740A55        | 100 pF, $\pm 5\%$ ; 50 V                 |
| C4556 thru 4558  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V                 |
| C4559  | 2113901C75        | Cap Chip HI Q 470 pF $\pm 5\%$           |
| C4564  | 2113901C52        | Cap Chip HI Q 56 pF $\pm 5\%$            |
| C4565  | 2113901C58        | Cap Chip HI Q 100 pF $\pm 5\%$           |
| C4566  | 2113901C37        | Cap Chip HI Q 20 pF $\pm 5\%$            |
| C4568  | 2113901C17        | Cap Chip HI Q 3.3 pF $\pm 0.25\text{pF}$ |
| C4569  | 2113901C75        | Cap Chip HI Q 470 pF $\pm 5\%$           |
| C4570 thru 4578  | 2113901A27        | Cap Chip HI Q 8.2 pF $\pm 0.50\text{pF}$ |
| C4579,4580   | 2113901C75        | Cap Chip HI Q 470 pF $\pm 5\%$           |
| C4581  | 2113743A23        | Cap Chip .220 UF 10% X7R                 |
| C4582  | 2113741A53        | 0.022 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C4583  | 2113741F33        | 2200 pF, $\pm 5\%$ ; 50V                 |
| C4584  | 2113741A51        | 0.018 $\mu\text{F}$ , $\pm 5\%$ ; 50V    |

## TTD1781A 40W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION   |
|------------------|-------------------|---|
|                  |                   | <b>DIODE: (SEE NOTE)</b>                              |
| CR4000,4001      | 4882290T04        | Diode; hot carrier                                    |
| CR4101 thru 4103 | 4813833C05        | dual 70 V   |
| CR4104           | 4813833C03        | dual 70V  |
| CR4400           | 4813833C05        | dual 70 V   |
| CR4501           | 4813833C02        | Dual diode; common cathode                            |
|                  |                   | <b>CONNECTOR, RECEPTACLE:</b>                         |
| J4101            | 0982492W01        | BNC CONN PCB VERTICAL RECEPT                          |
| J4102            | 2884490T03        | HDR 2X3 VERT PWR                                      |
| J4501,4502       | 2884490T03        | HDR 2X3 VERT PWR                                      |
|                  |                   | <b>CONNECTOR, PLUG:</b>                               |
| J4503            | 2885155U01        | plug, 10-contact                                      |
|                  |                   | <b>COIL, INDUCTOR:</b>                                |
| L4000 thru 4002  | 2483035N64        | COIL; airwound 12 awg; 3-turns                        |
| L4003            | 2411087A20        | 0.33 uH   |
| L4004            | 2411087A22        | COIL; chip .47 uH                                     |
| L4005            | 2411087A02        | 0.010 uH  |
| L4006            | 2411087A20        | 0.33 uH   |
| L4007            | 2411087A22        | COIL; chip .47 uH                                     |
| L4008            | 2460591A49        | COIL; airwound 8.01                                   |
| L4201            | 2484657R01        | ferrite bead  |
| L4202            | 2460591C23        | COIL AIR WOUND INDUC 13.85                            |
| L4203            | 2460591X01        | COIL AIR WOUND SQUARE 21 NH                           |
| L4204            | 2484657R01        | ferrite bead  |
| L4400            | 2411087A07        | 0.027 uH  |
| L4401            | 2484657R01        | ferrite bead  |
| L4402            | 2411087A13        | .082 UH   |
| L4403            | 2411087A04        | 0.015 uH  |
| L4404,4405       | 2484657R01        | ferrite bead  |
| L4406            | 2411087A04        | 0.015 uH  |
| L4407            | 2484331M10        | COIL, airwound 22 awg; 4-turns                        |
| L4501 thru 4505  | 2462587X61        | IND CHIP LO-PRO 470 NH 5%                             |
| L4507,4508       | 2462587X61        | IND CHIP LO-PRO 470 NH 5%                             |
| L4509            | 2460591X07        | COIL AW 4 TURN 61.6 NH 16 GA                          |
| L4510            | 2460591X06        | COIL AW 4 TURN 47 NH 16 GA                            |
| L4512            | 2484657R01        | ferrite bead  |
| L4514            | 2484657R01        | ferrite bead  |
| L4515 thru 4521  | 2462587X55        | IND CHIP LO-PRO 150 NH 5%                             |
| L4522            | 2462587X61        | IND CHIP LO-PRO 470 NH 5%                             |
| L4523,4524       | 2462587X55        | IND CHIP LO-PRO 150 NH 5%                             |
|                  |                   | <b>TRANSISTOR: (SEE NOTE)</b>                         |
| Q4101            | 4813824A10        | NPN   |
| Q4102            | 4813822D08        | Transistor; 100 V                                     |
| Q4201            | 4813824A11        | NPN   |
| Q4202            | 4813824A17        | PNP   |
| Q4203,4204       | 4813824A11        | NPN   |
| Q4205            | 4813824B01        | TSTR NPN 40V GEN PURP 2222AT1                         |
| Q4206            | 4884411L04        | TSTR M1104  |
| Q4400            | 4813827A26        | Transistor; NPN                                       |
| Q4401            | 4882233P54        | Transistor; NPN                                       |
|                  |                   | <b>RESISTOR, FIXED: <math>\pm 5\%</math>; 1/16 W:</b> |
|                  |                   | UNLESS OTHERWISE STATED                               |
| R4101            | 0683962T01        | 1 Ohm, $\pm 5\%$ ; 1 W                                |
| R4103            | 0611079A60        | 270 Ohms, $\pm 5\%$ ; 1/10 W                          |
| R4104            | 0611079A01        | 0 Ohms, $\pm 5\%$ ; 1/10 W                            |
| R4105            | 0611079A98        | 10K, $\pm 5\%$ ; 1/10 W                               |
| R4106            | 0611072A53        | 1.5K, $\pm 5\%$ ; 1/4W                                |
| R4107            | 0611072A49        | 1K, $\pm 5\%$ ; 1/4 W                                 |
| R4108            | 0611072A37        | 330 1/4 W   |
| R4110            | 0611079A60        | 270 Ohms, $\pm 5\%$ ; 1/10 W                          |
| R4111            | 0611072A49        | 1K, $\pm 5\%$ ; 1/4 W                                 |
| R4112            | 0611072A53        | 1.5K, $\pm 5\%$ ; 1/4W                                |
| R4113            | 0611072A49        | 1K, $\pm 5\%$ ; 1/4 W                                 |
| R4118            | 0683962T13        | 3.3 Ohms, $\pm 5\%$ ; 1W                              |
| R4119            | 0683962T42        | 51 Ohms, $\pm 5\%$ ; 1 W                              |
| R4201 thru 4204  | 0611077A98        | 10K, $\pm 5\%$ ; 1/8 W                                |
| R4206            | 0683962T42        | 51 Ohms, $\pm 5\%$ ; 1 W                              |
| R4207            | 0611077A30        | 15 Ohms, $\pm 5\%$ ; 1/8 W                            |
| R4208            | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W                            |
| R4209,4210       | 0611077A01        | 0 Ohm, $\pm 5\%$ ; 0 W                                |
| R4211            | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W                            |
| R4400,4401       | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W                            |
| R4402            | 0611077A90        | 4.7K, $\pm 5\%$ ; 1/8 W                               |
| R4403,4404       | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W                            |
| R4405            | 0611077A12        | 2.7 Ohms, $\pm 5\%$ ; 1/8 W                           |
| R4406,4407       | 0611077A26        | 10 Ohms, $\pm 5\%$ ; 1/8 W                            |

68P81094E14-C

Parts List (Sheet 17 of 18)

03/26/99

TTD1781A 40W PA Module (132 to 174 MHz)

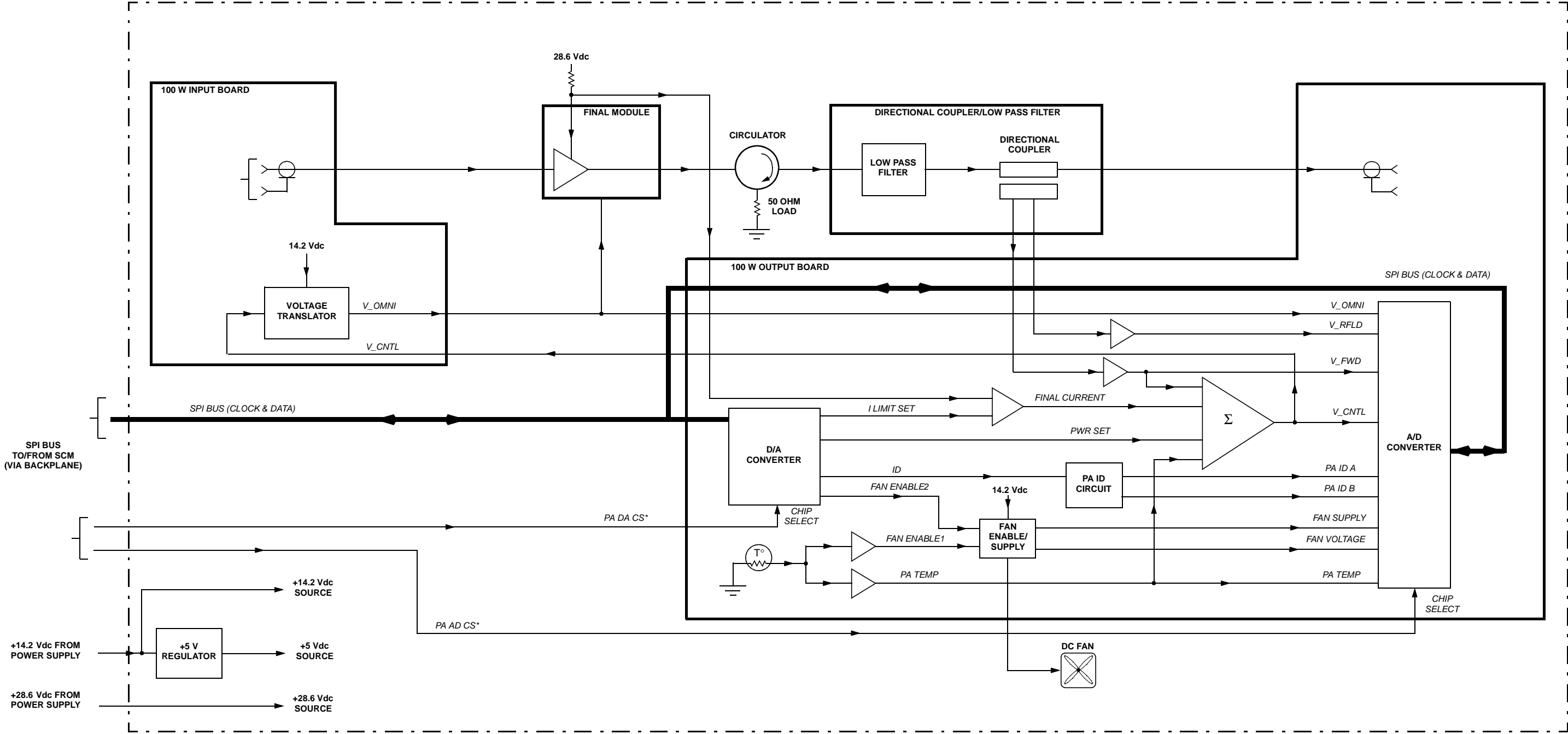
| REFERENCE SYMBOL               | MOTOROLA PART NO. | DESCRIPTION                             |
|--------------------------------|-------------------|---|
| R4501                          | 0662057A83        | Chip Res 27K Ohms                       |
| R4507,4508                     | 0662057A77        | Chip Res 15K Ohms                       |
| R4509                          | 0611079F81        | Chip Res6.81K 1/10W 1% 0805             |
| R4510                          | 0662057A89        | Chip Res 47K Ohms                       |
| R4513                          | 0662057A97        | Chip Res 100K Ohms                      |
| R4514                          | 0662057A73        | Chip Res 10K Ohms                       |
| R4515                          | 0662057A89        | Chip Res 47K Ohms                       |
| R4516                          | 0662057B47        | Chip Res 0 Ohms +/-0.050 Ohms           |
| R4518                          | 0662057A69        | Chip Res 6800 Ohms                      |
| R4522                          | 0662057A73        | Chip Res 10K Ohms                       |
| R4523                          | 0662057A77        | Chip Res 15K Ohms                       |
| R4525                          | 0662057A80        | Chip Res 20K Ohms                       |
| R4526                          | 0662057A79        | Chip Res 18K Ohms                       |
| R4530                          | 0662057A37        | Chip Res 330 Ohms                       |
| R4532                          | 0611077A74        | 1K, ±5%; 1/8 W                          |
| R4536,4537                     | 0662057A49        | Chip Res 1000 Ohms                      |
| R4539                          | 0662057A57        | Chip Res 2200 Ohms                      |
| R4540,4541                     | 0662057A49        | Chip Res 1000 Ohms                      |
| R4543                          | 0662057A57        | Chip Res 2200 Ohms                      |
| R4544                          | 0611079F44        | Chip Res2.80K 1/10W 1% 0805             |
| R4545                          | 0662057A49        | Chip Res 1000 Ohms                      |
| R4547                          | 0662057A49        | Chip Res 1000 Ohms                      |
| R4554,4555                     | 0662057A94        | Chip Res 75K Ohms                       |
| R4556,4557                     | 0662057A57        | Chip Res 2200 Ohms                      |
| R4558                          | 0611079F81        | Chip Res6.81K 1/10W 1% 0805             |
| R4559                          | 0662057A49        | Chip Res 1000 Ohms                      |
| R4560                          | 0662057A65        | Chip Res 4700 Ohms                      |
| R4562                          | 0662057A49        | Chip Res 1000 Ohms                      |
| R4563                          | 0682089V01        | SMT .01 2W                              |
| R4564                          | 0662057A65        | Chip Res 4700 Ohms                      |
| R4565,4566                     | 0662057A73        | Chip Res 10K Ohms                       |
| R4567                          | 0662057A49        | Chip Res 1000 Ohms                      |
| R4568                          | 0662057A55        | Chip Res 1800 Ohms                      |
| R4569                          | 0662057A79        | Chip Res 18K Ohms                       |
| R4570                          | 0662057B04        | Chip Res 180K Ohms                      |
| R4571                          | 0662057B05        | Chip Res 200K Ohms                      |
| R4572                          | 0662057A77        | Chip Res 15K Ohms                       |
| R4577,4578                     | 0662057A97        | Chip Res 100K Ohms                      |
| THERMISTOR:                    |                   |   |
| RT4501                         | 0680149M02        | 100 k, ±10%; 240 mW                     |
| INTEGRATED CIRCUIT: (SEE NOTE) |                   |   |
| U4504                          | 5113816A07        | 5-Volt Positive Regulator               |
| U4505                          | 5113819A05        | High Performance, Single Supply         |
| U4506                          | 5182374Y01        | IC A/D 8 BIT                            |
| U4507                          | 5180057S02        | IC CMOS CUST DA CONV 13" REEL           |
| U4508                          | 5113819A05        | High Performance, Single Supply         |
| CABLE ASSEMBLY:                |                   |   |
| W4000 thru 4007                | 4280500F01        | T & R VER OF 4282981X01                 |
| W4201 thru 4206                | 4280500F01        | T & R VER OF 4282981X01                 |
| W4207,4208                     | 4283431X01        | GROUND CLIP                             |
| W4209,4210                     | 4284952P02        | 16 GAUGE 21.1MM                         |
| NON-REFERENCED ITEMS           |                   |   |
| TFD6560A                       |                   | Lowpass Filter and Final Coupler        |
| THN6785A                       |                   | MODULE HOUSING PA LOW POWER             |
| TLD9820A                       |                   | RF OMNI Module                          |
| TTD6370A                       |                   | PA 50W MODULE                           |
| TTD6451A                       |                   | PA,HIGH BAND,40W,OUTPUT BD R1           |
| TTD6470B                       |                   | PA HIGH BAND 40W INPUT BD               |
| 0310907A19                     |                   | SCREW, machine: M3x0.5x8 (24 used)      |
| 0310907A40                     |                   | SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used) |
| 0383498N05                     |                   | SCREW, tapping: M4 x 0.7 x 12 (2 used)  |
| 0782106V01                     |                   | BRACKET; low pass filter                |
| 0783544X01                     |                   | BRACKET, OMNI                           |
| 0900816159                     |                   | CONNECTOR, receptacle: coaxial          |
| 1582626X02                     |                   | COVER PA & PS CASTING                   |
| 2682624X06                     |                   | HEATSINK LOW POWER AMP                  |
| 3082728X05                     |                   | CBL 6-WIRE                              |
| 3282170V01                     |                   | GASKET RF (56 used)                     |
| 5482006W01                     |                   | Label, PCB barcode                      |
| 5483323X01                     |                   | LABEL, FREQ. REF.                       |
| 5484960T01                     |                   | Label, barcode: 6.3 x 12.7mm, white     |
| 5484960T02                     |                   | LABEL BLANK BARCODE (2 used)            |
| 6482474V01                     |                   | PLATE                                   |
| 6483129N01                     |                   | PLATE, transistor mtg (2 used)          |

TTD1781A 40W PA Module (132 to 174 MHz)

| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION |
|---|-------------------|-------------|
| <b>Note:</b> For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number. |                   |             |

100W PA MODULE  
MODEL CLD1301A/CLD1300A

|              | CLD1301<br>132 to 154 MHz | CLD1300<br>150 to 174 MHz |
|--------------|---------------------------|---------------------------|
| Final Module | CLD6097                   |                           |
| Coupler/LPF  | TFD6560                   |                           |
| Input Board  | CLD6096                   |                           |
| Output Board | CLD6095                   | CLD6099                   |
| Circulator   | 5884911T28                | 5884911T29                |

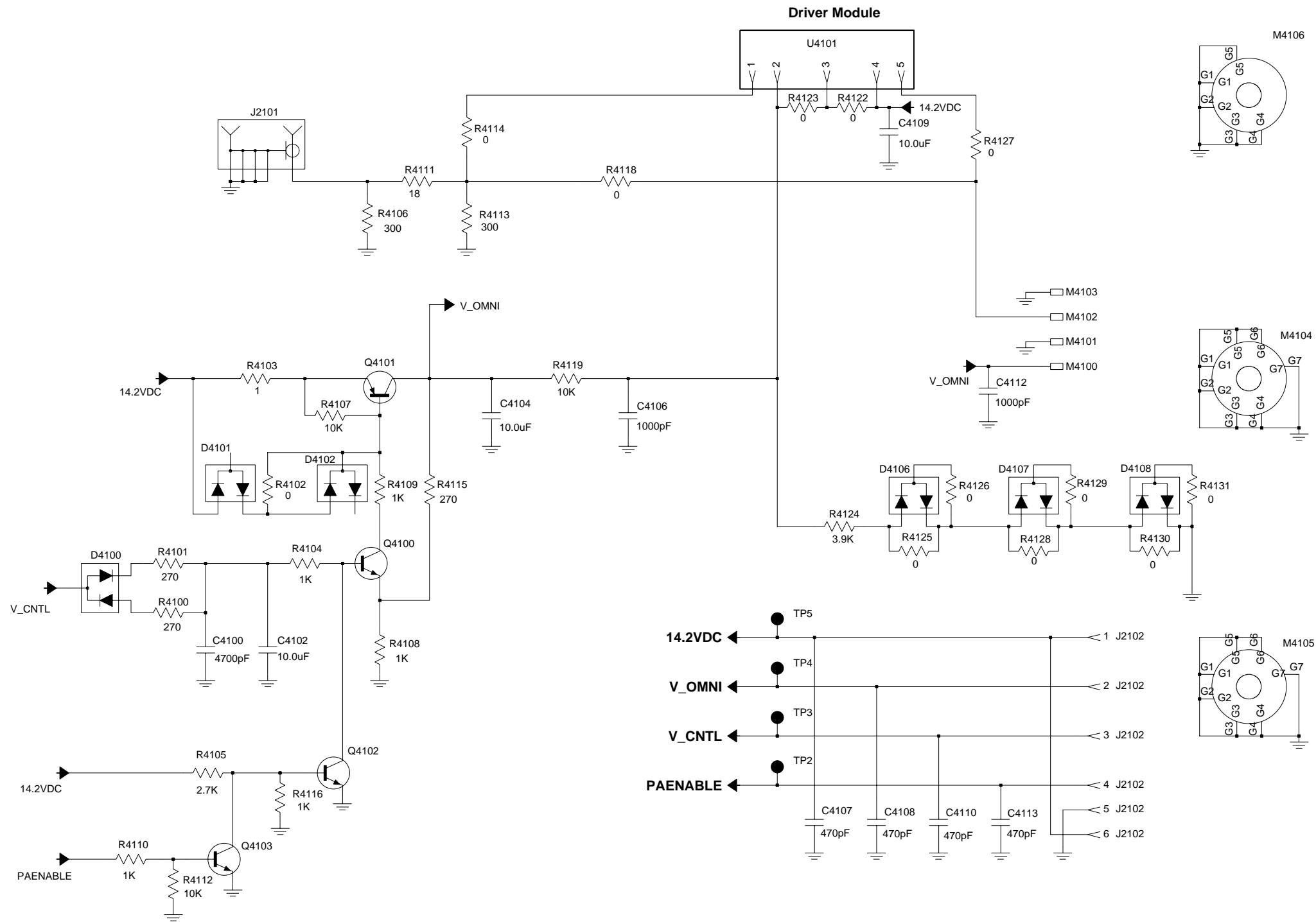


100W PA FUNCTIONAL BLOCK DIAGRAM

**100W PA MODULE**  
**MODEL CLD1301A/CLD1300A**

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100W PA MODULE  
MODEL CLD1301A/CLD1300A



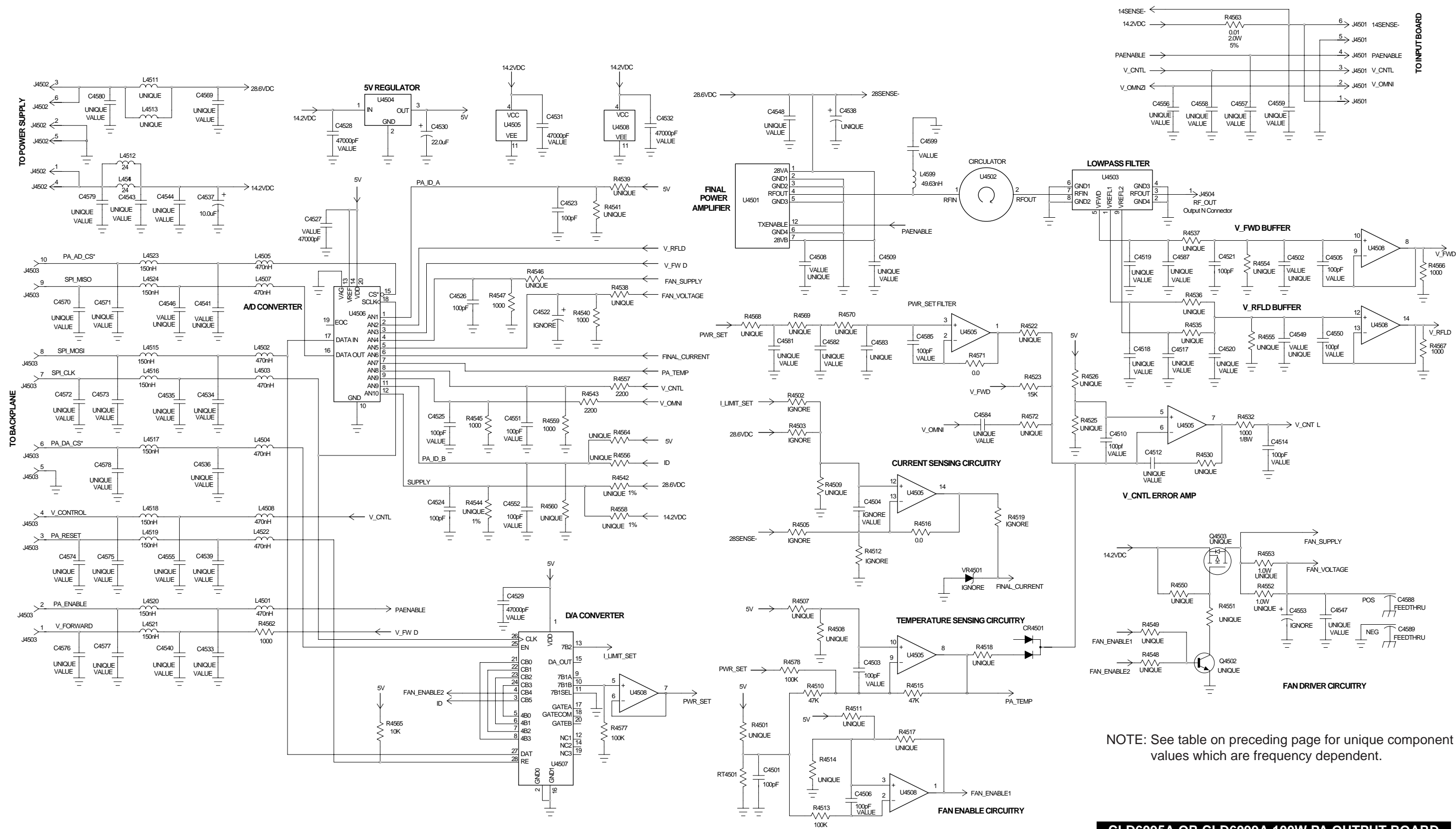
CLD6096A 100W PA INPUT BOARD (CLD1301A & CLD1300A)

100W PA MODULE  
MODEL CLD1301A/CLD1300A

| REF. DES | CLD6099A     | CLD6095A     |
|----------|--------------|--------------|
| C4502    | 470          | 470          |
| C4508    | 470          | 470          |
| C4509    | 470          | 470          |
| C4512    | 47000        | 47000        |
| C4517    | NOT USED     | NOT USED     |
| C4518    | 470          | 470          |
| C4519    | 470          | 470          |
| C4520    | 470          | 470          |
| C4522    | 10 uF        | 10 uF        |
| C4533    | 470          | 470          |
| C4534    | 470          | 470          |
| C4535    | 470          | 470          |
| C4536    | 470          | 470          |
| C4538    | 10 uF        | 10 uF        |
| C4539    | 470          | 470          |
| C4540    | 470          | 470          |
| C4541    | 470          | 470          |
| C4543    | 470          | 470          |
| C4544    | 470          | 100          |
| C4546    | 100          | 100          |
| C4547    | 470          | 470          |
| C4548    | 470          | 470          |
| C4549    | 470          | 470          |
| C4553    | 100 uF       | 100 uF       |
| C4555    | 470          | 470          |
| C4556    | 470          | 470          |
| C4557    | 470          | 470          |
| C4558    | 470          | 470          |
| C4559    | 56           | 470          |
| C4569    | 470          | 100          |
| C4579    | 470          | 470          |
| C4580    | 470          | 470          |
| C4581    | NOT USED     | NOT USED     |
| C4582    | NOT USED     | NOT USED     |
| C4583    | NOT USED     | NOT USED     |
| C4584    | NOT USED     | NOT USED     |
| C4587    | NOT USED     | NOT USED     |
| L4511    | FERRITE BEAD | FERRITE BEAD |
| L4513    | FERRITE BEAD | FERRITE BEAD |
| Q4502    | NPN TRNSTR   | NPN TRNSTR   |
| Q4503    | P-CH TRNSTR  | P-CH TRNSTR  |
| R4501    | 27           | 27           |
| R4507    | 3.92         | 10           |
| R4508    | 3.32         | 10           |
| R4509    | 5.76         | 5.76         |
| R4511    | 1.5          | 1.5          |
| R4514    | 2.2          | 2.2          |
| R4517    | 100          | 100          |
| R4518    | 6.8          | 6.8          |
| R4524    | NOT USED     | NOT USED     |
| R4525    | 12           | 12           |
| R4526    | 10           | 10           |
| R4530    | 1            | 1            |
| R4535    | NOT USED     | NOT USED     |
| R4536    | 27           | 27           |
| R4537    | 27           | 27           |
| R4538    | 2.2          | 2.2          |
| R4539    | 2.2          | 2.2          |
| R4541    | 1            | 1            |
| R4542    | 31.6         | 31.6         |
| R4544    | 5.76         | 5.76         |
| R4546    | 2.2          | 2.2          |
| R4548    | 10           | 10           |
| R4549    | 10           | 10           |
| R4550    | 10           | 10           |
| R4551    | 1            | 1            |
| R4552    | 9.1 Ohms     | 9.1 Ohms     |
| R4553    | 9.1 Ohms     | 9.1 Ohms     |
| R4554    | 47           | 47           |
| R4555    | 47           | 47           |
| R4556    | 2.2          | 2.2          |
| R4558    | NOT USED     | NOT USED     |
| R4560    | 1.5          | 15           |
| R4564    | 1.5          | 15           |
| R4566    | 1            | 1            |
| R4568    | 0.0          | 0.0          |
| R4569    | 0.0          | 0.0          |
| R4570    | 1            | 1            |
| R4571    | 0.0          | 0.0          |
| R4572    | NOT USED     | NOT USED     |
| C4599    | NOT USED     | 7.5          |
| L4599    | NOT USED     | 49.6 nH      |

NOTE: All values in pF or kOhm unless otherwise marked

100W PA MODULE  
MODEL CLD1301A/CLD1300A



NOTE: See table on preceding page for unique component values which are frequency dependent.

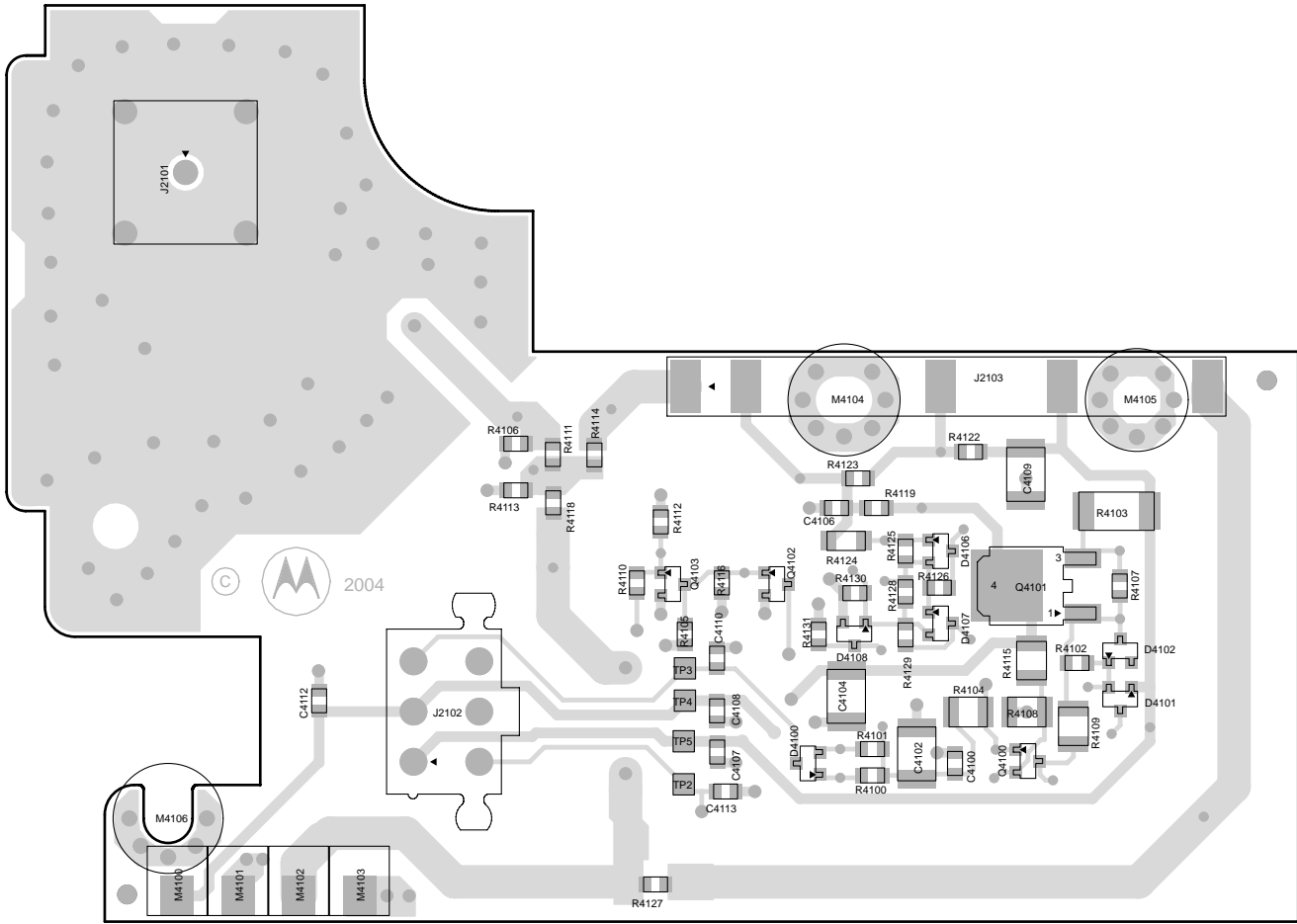
CLD6095A OR CLD6099A 100W PA OUTPUT BOARD



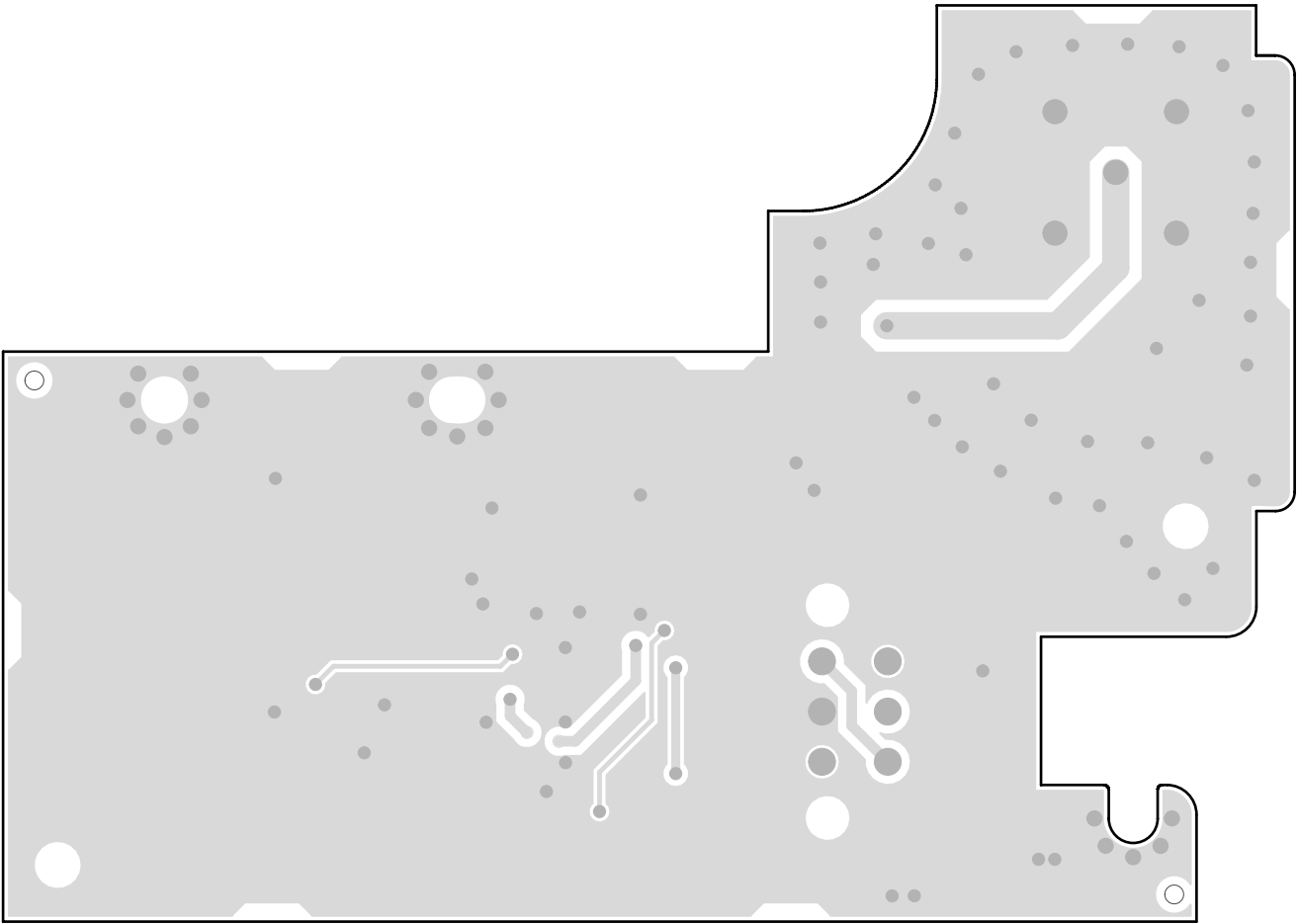
**100W PA MODULE**  
**MODEL CLD1301A/CLD1300A**

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100W PA MODULE  
MODEL CLD1301A/CLD1300A



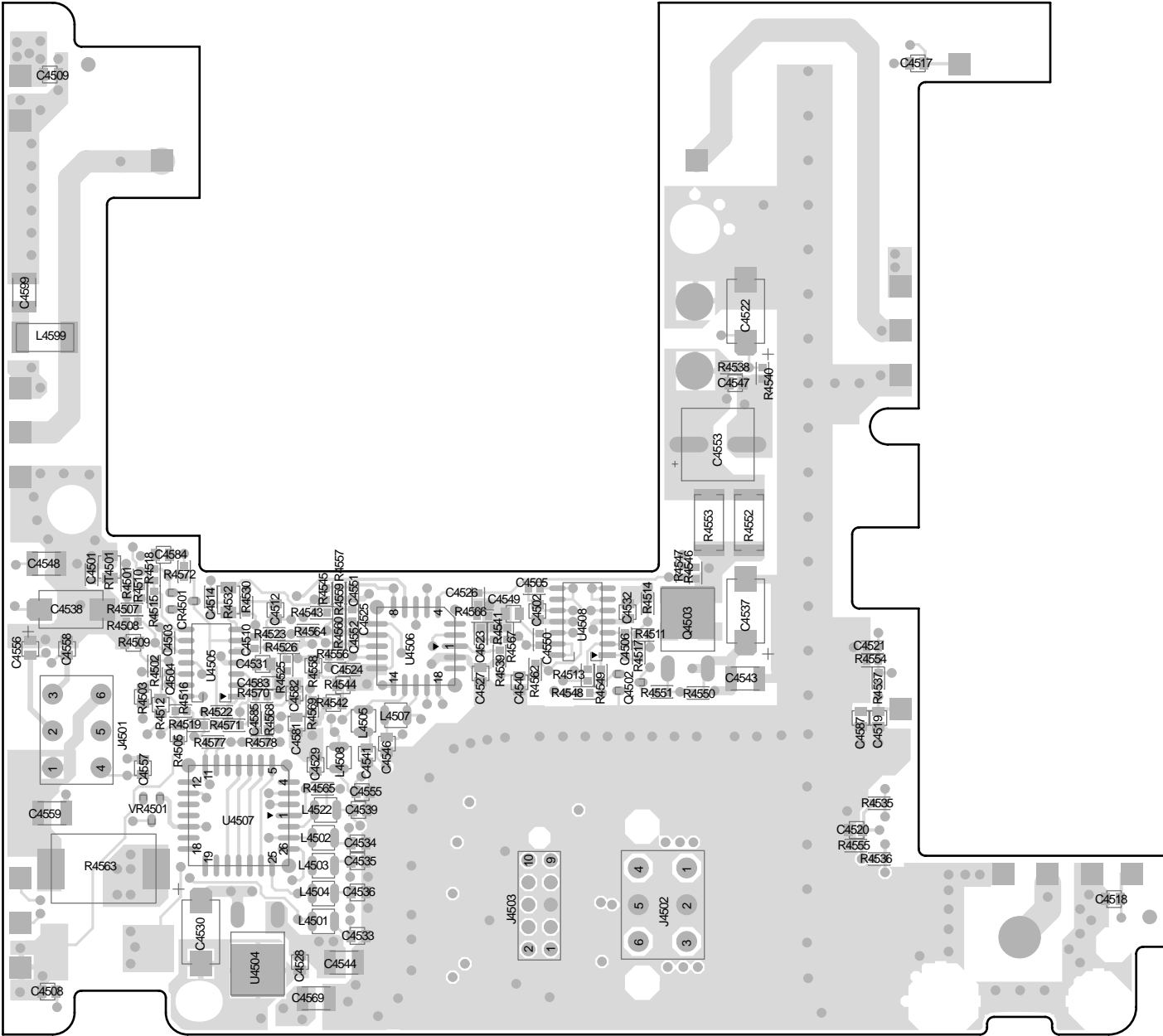
HEAVY COMPONENT SIDE



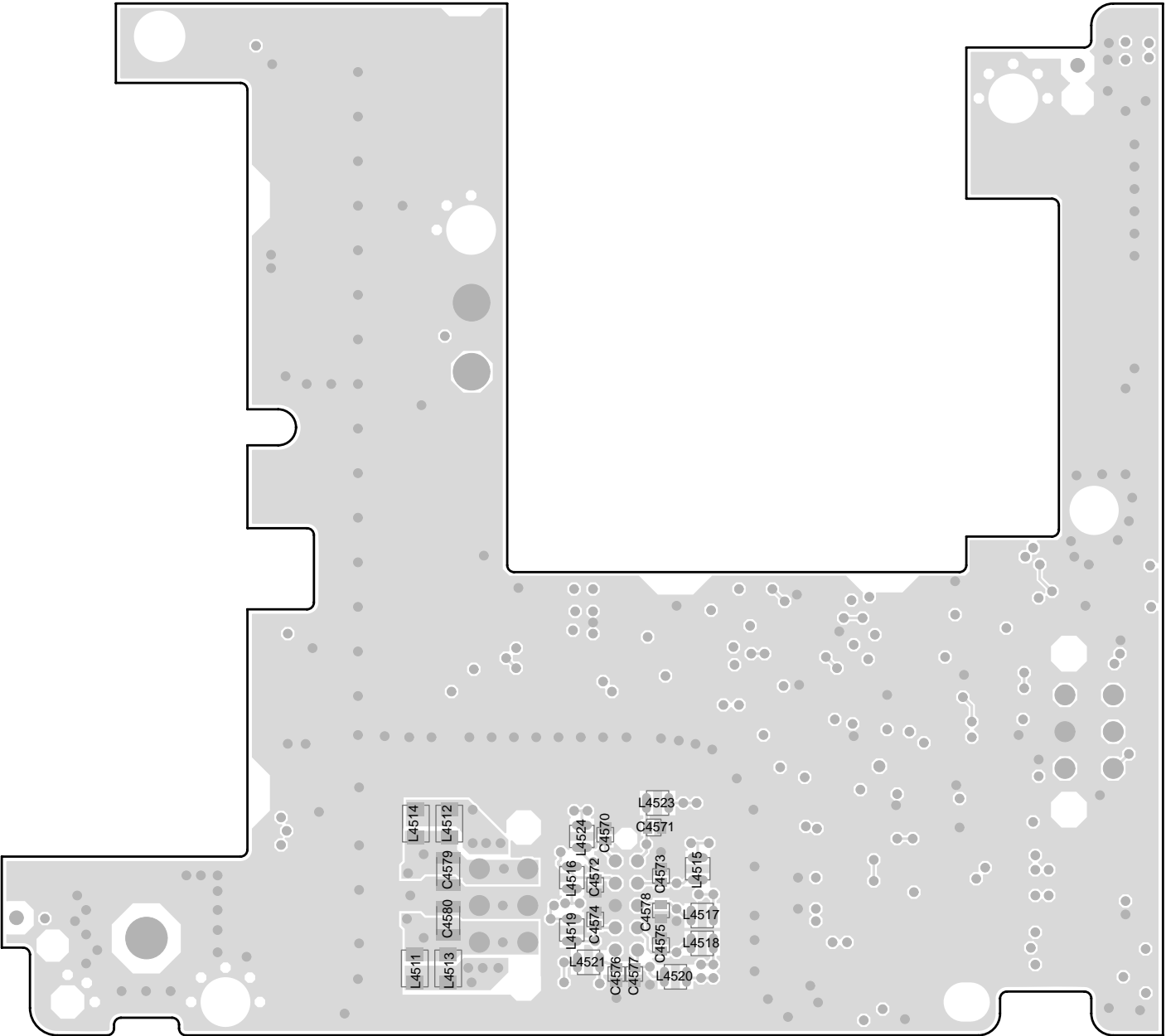
LIGHT COMPONENT SIDE

CLD6096A 100W PA INPUT BOARD DETAIL

100W PA MODULE  
MODEL CLD1301A/CLD1300A



HEAVY COMPONENT SIDE



LIGHT COMPONENT SIDE

CLD6095A OR CLD6099A 100W PA OUTPUT BOARD DETAIL

# Parts List

## CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE<br>SYMBOL | MOTOROLA<br>PART NO. | DESCRIPTION |
|---------------------|----------------------|-------------|
|---------------------|----------------------|-------------|

### CLD1301A (Top Level Kits)

|            |  |
|------------|--|
| 4280500F01 | T & R Version of 4282981X01            |
| 5884911T28 | Circulator 200W 132-154MHZ             |
| CLD6095A   | VHF R1 100W Output Board<br>MTR2000    |
| CLD6096A   | MTR2000 VHF Input DC Board             |
| CLD6097A   | Quantar/MTR2000 VHF Final Module<br>R2 |
| CLN8151A   | MTR2000 VHF Hardware Kit               |
| TFD6560A   | Lowpass Filter And Final Coupler       |
| TTN5238A   | Circulator Load                        |

### CLD6096A (Input Board R1)

**CAPACITOR, FIXED:  $\mu\text{F} \pm 10\%$ ; 100 V:**  
UNLESS OTHERWISE STATED

|                 |            |  |
|-----------------|------------|--|
| C4100           | 2113741A37 | Cap Chip CL2 X7R Reel 4700   |
| C4104           | 2109822S06 | Cap Chip Cer 10uF 16V  |
| C4107 thru 4108 | 2113740A71 | Cap Chip Reel CL1 +/-30 470  |
| C4109           | 2109822S06 | Cap Chip Cer 10uF 16V  |
| C4110           | 2113740A71 | Cap Chip Reel CL1 +/-30 470  |
| C4112           | 2113740A79 | Cap Chip Reel CL1 +/-30 1000   |
| C4113           | 2113740A71 | Cap Chip Reel CL1 +/-30 470  |
| D4100           | 4813833C05 | Diode,RECT,BAV99L,,TO-<br>236AB,715MA,,.225W,,DL 70V A7X<br>BAV99LT1 |

**DIODE: (SEE NOTE)**

|       |            |  |
|-------|------------|--|
| D4101 | 4813833C05 | Diode,RECT,BAV99L,,TO-<br>236AB,715MA,,.225W,,DL 70V A7X<br>BAV99LT1 |
|-------|------------|--|

**CONNECTOR, RECEPTACLE:**

|       |            |                              |
|-------|------------|------------------------------|
| J2101 | 0982492W01 | BNC CONN PCB VERTICAL RECEPT |
| J2102 | 2884490T03 | HDR 2X3 VERT PWR             |

**TRANSISTOR: (SEE NOTE)**

|       |            |                           |
|-------|------------|---------------------------|
| Q4100 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |
| Q4101 | 4813822A09 | TSTR PNP 40V 3A MJD32T4   |
| Q4102 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |
| Q4103 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |

**RESISTOR, FIXED:  $\pm 5\%$ ; 1/16 W:**  
UNLESS OTHERWISE STATED

|                 |            |                                |
|-----------------|------------|--------------------------------|
| R4100 thru 4101 | 0611079A60 | Res Fixed Chip 270 5 1/10W A/P |
| R4102           | 0611079A01 | Res Fixed Chip O 5 1/10W A/P   |
| R4103           | 0683962T01 | Res Chip 1.0 5-1               |
| R4104           | 0611072A49 | Res Chip 1000 5 1/4            |
| R4105           | 0611079A84 | Res Fixed Chip 2700 5 1/10 A/P |
| R4106           | 0611079A72 | Res Fixed Chip 820 5 1/10W A/P |
| R4107           | 0611079A98 | Res Fixed Chip 10K 5 1/10 A/P  |
| R4108 thru 4109 | 0611072A49 | Res Chip 1000 5 1/4            |
| R4110           | 0611079A74 | Res Fixed Chip 1000 5 1/10 A/P |
| R4111           | 0611079A20 | Res Fixed Chip 5.6 5 1/10W A/P |
| R4112           | 0611079A98 | Res Fixed Chip 10K 5 1/10 A/P  |
| R4113           | 0611079A72 | Res Fixed Chip 820 5 1/10W A/P |
| R4115           | 0611072A35 | Res Chip 270 5 1/4             |
| R4116           | 0611079A74 | Res Fixed Chip 1000 5 1/10 A/P |
| R4118           | 0611079A01 | Res Fixed Chip O 5 1/10W A/P   |

**NON-REFERENCED ITEMS**

|            |                             |
|------------|-----------------------------|
| 5482006W03 | Barcode Label               |
| 5484960T02 | BLank Barcode Label for KVL |
| 8484944Y01 | PWB, DC DIST, Input, PA     |

## CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE<br>SYMBOL | MOTOROLA<br>PART NO. | DESCRIPTION |
|---------------------|----------------------|-------------|
|---------------------|----------------------|-------------|

### CLD6095A (Output Board R1)

**CAPACITOR, FIXED:  $\mu\text{F} \pm 10\%$ ; 100 V:**  
UNLESS OTHERWISE STATED

|                 |            |                                  |
|-----------------|------------|----------------------------------|
| C4501           | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4502           | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4503           | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4505 thru 4506 | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4508 thru 4509 | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4510           | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4512           | 2113741A61 | Cap Chip CL2 X7R Reel 47000      |
| C4514           | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4518 thru 4520 | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4521           | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4522           | 2311049A45 | Cap Tant Chip 10 10 35           |
| C4523 thru 4526 | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4527 thru 4529 | 2113741A61 | Cap Chip CL2 X7R Reel 47000      |
| C4530           | 2311049A21 | Cap Tant Chip 22 10 20 A/P       |
| C4531 thru 4532 | 2113741A61 | Cap Chip CL2 X7R Reel 47000      |
| C4533 thru 4536 | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4537           | 2311049A45 | Cap Tant Chip 10 10 35           |
| C4538           | 2311049A45 | Cap Tant Chip 10 10 35           |
| C4539 thru 4541 | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4543           | 2113901C75 | Cap Chip High Q 470 pF +/- 5%    |
| C4544           | 2113901C58 | Cap Chip High Q 100 pF +/- 5%    |
| C4546           | 2113740A55 | Cap Chip Reel CL1 +/-30 100      |
| C4547           | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4548           | 2113901C75 | Cap Chip High Q 470 pF +/- 5%    |
| C4549           | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4550 thru 4552 | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4553           | 2380090M36 | Cap 100 uF 25V                   |
| C4555 thru 4558 | 2113740A71 | Cap Chip Reel CL1 +/-30 470      |
| C4559           | 2113901C75 | Cap Chip High Q 470 pF +/- 5%    |
| C4569           | 2113901C58 | Cap Chip High Q 100 pF +/- 5%    |
| C4570 thru 4578 | 2113740A27 | Cap Chip Reel CL1 +/-30 8.2      |
| C4579 thru 4580 | 2113901C75 | Cap Chip High Q 470 pF +/- 5%    |
| C4585           | 2113740F51 | Cap Chip Reel CL1 +/-30 100      |
| C4599           | 2113901C26 | Cap Chip High Q 7.5 pF +/-0.50pF |

**DIODE: (SEE NOTE)**

|        |            |                             |
|--------|------------|-----------------------------|
| CR4501 | 4813833C02 | Diode DUAL 70V 5B COMM CATH |
|--------|------------|-----------------------------|

**CONNECTOR, RECEPTACLE:**

|       |            |                  |
|-------|------------|------------------|
| J4501 | 2884490T03 | HDR 2X3 VERT PWR |
| J4502 | 2884490T03 | HDR 2X3 VERT PWR |

**CONNECTOR, PLUG:**

|       |            |                           |
|-------|------------|---------------------------|
| J4503 | 2885155U01 | Plug, Header, 10 Contacts |
|-------|------------|---------------------------|

**COIL, INDUCTOR:**

|                 |            |                                     |
|-----------------|------------|-------------------------------------|
| L4501 thru 4508 | 2462587X61 | Inductor Chip Low-profile 470 NH 5% |
| L4511 thru 4514 | 2484657R01 | Inductor Bead Chip                  |
| L4515 thru 4521 | 2462587X55 | Inductor Chip Low-profile 150 NH 5% |
| L4522           | 2462587X61 | Inductor Chip Low-profile 470 NH 5% |
| L4523 thru 4524 | 2462587X55 | Inductor Chip Low-profile 150 NH 5% |
| L4599           | 2486015Y01 | Coil, AWC, 49.63, Top Hat           |

**TRANSISTOR: (SEE NOTE)**

|       |            |                           |
|-------|------------|---------------------------|
| Q4502 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |
| Q4503 | 4813821A09 | TSTR P-CH 60V 12A _2955_  |

**RESISTOR, FIXED:  $\pm 5\%$ ; 1/16 W:**  
UNLESS OTHERWISE STATED

|                 |            |                         |
|-----------------|------------|-------------------------|
| R4501           | 0662057A83 | Chip Res 27K Ohms 5%    |
| R4507 thru 4508 | 0662057P10 | Res Chip 10.0K 1% 30X60 |

# Parts List

## CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                      |
|---------------------------------------|-------------------|----------------------------------|
| R4509                                 | 0611079F74        | Res Chip 5.76K 1/10W 1% 0805     |
| R4510                                 | 0662057A89        | Chip Res 47K Ohms 5%             |
| R4511                                 | 0662057A53        | Chip Res 1500 Ohms 5%            |
| R4513                                 | 0662057A97        | Chip Res 100K Ohms 5%            |
| R4514                                 | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4515                                 | 0662057A89        | Chip Res 47K Ohms 5%             |
| R4516                                 | 0662057B47        | Chip Res 0 Ohms +/-0 50 Ohms     |
| R4517                                 | 0662057A97        | Chip Res 100K Ohms 5%            |
| R4518                                 | 0662057A69        | Chip Res 6800 Ohms 5%            |
| R4522                                 | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4523                                 | 0662057P02        | Res. Chip 15K 1% 30X60           |
| R4525                                 | 0662057A75        | Chip Res 12K Ohms 5%             |
| R4526                                 | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4530                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4532                                 | 0611077E94        | Res Chip 1000 1 1/8W             |
| R4536 thru 4537                       | 0662057A83        | Chip Res 27K Ohms 5%             |
| R4538 thru 4539                       | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4540 thru 4541                       | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4542                                 | 0611079G49        | Res Chip 31.6K 1/10W 1% 0805     |
| R4543                                 | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4544                                 | 0611079F74        | Res Chip 5.76K 1/10W 1% 0805     |
| R4545                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4546                                 | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4547                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4548 thru 4550                       | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4551                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4552 thru 4553                       | 0683962T24        | Res Chip 9.1 5-1                 |
| R4554 thru 4555                       | 0662057A89        | Chip Res 47K Ohms 5%             |
| R4556                                 | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4557                                 | 0662057A83        | Chip Res 27K Ohms 5%             |
| R4559                                 | 0662057A75        | Chip Res 12K Ohms 5%             |
| R4560                                 | 0662057P02        | Res. Chip 15K 1% 30X60           |
| R4562                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4563                                 | 0682089V01        | SMT .01 2W                       |
| R4564                                 | 0662057P02        | Res. Chip 15K 1% 30X60           |
| R4565                                 | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4566                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4567                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4568 thru 4569                       | 0662057B47        | Chip Res 0 Ohms +/-0 50 Ohms     |
| R4570                                 | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4571                                 | 0662057B47        | Chip Res 0 Ohms +/-0 50 Ohms     |
| R4577 thru 4578                       | 0662057A97        | Chip Res 100K Ohms 5%            |
| <b>THERMISTOR:</b>                    |                   |                                  |
| RT4501                                | 0680149M02        | THERMISTOR Chip 100K OHM         |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |                                  |
| U4504                                 | 5113816A07        | REG 5V POS 500MA<br>MC78M05BDTRK |
| U4505                                 | 5113819A04        | IC QD OP AMP GEN PUR P MC3303D   |
| U4506                                 | 5182374Y01        | IC A/D 8 BIT                     |
| U4507                                 | 5180057S02        | IC CMOS CUST DA CONV 13" Reel    |
| U4508                                 | 5113819A04        | IC QD OP AMP GEN PUR P MC3303D   |
| <b>NON-REFERENCED ITEMS</b>           |                   |                                  |
|                                       | 5482006W03        | Barcode Label                    |
|                                       | 5484960T02        | Blank Barcode Label for KVL      |
|                                       | 8483244X05        | PCB, PA Out, VHF, 100W           |

## CLD6097A (Final Module)

**CAPACITOR, FIXED:  $\mu\text{F} \pm 10\%$ ; 100 V:**

|    |            |                              |
|----|------------|------------------------------|
| C1 | 2113740A79 | Cap Chip Reel CL1 +/-30 1000 |
|----|------------|------------------------------|

## CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                        |
|------------------|-------------------|------------------------------------|
| C100             | 2113951A52        | Cap NPO 68.0pF +/-5% 250V HI Freq  |
| C101 thru 102    | 2113951A34        | Cap NPO 10.0pF +/-5% 250V HI Freq  |
| C103 thru 104    | 2113951A42        | Cap NPO 27.0pF +/-5% 250V HI Freq  |
| C105             | 2113951B58        | Cap NPO High Freq 120 +/- 5% 250V  |
| C106             | 2113901C49        | Cap Chip High Q 43 pF +/- 5%       |
| C107             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C108             | 2113901C75        | Cap Chip High Q 470 pF +/- 5%      |
| C109             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C110 thru 111    | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C112             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C150 thru 153    | 2109553T52        | Cap Ceramic 39pF +/-5%             |
| C155             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C156             | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C157             | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C158 thru 159    | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C160             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C161             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C197             | 2113951B34        | Cap NPO 10.0pF +/- 5% 250V HI Freq |
| C198             | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C199             | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C2               | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C200             | 2113951A52        | Cap NPO 68.0pF +/-5% 250V HI Freq  |
| C201 thru 202    | 2113951A34        | Cap NPO 10.0pF +/-5% 250V HI Freq  |
| C203 thru 204    | 2113951A42        | Cap NPO 27.0pF +/-5% 250V HI Freq  |
| C205             | 2113951B58        | Cap NPO High Freq 120 +/- 5% 250V  |
| C206             | 2113901C49        | Cap Chip High Q 43 pF +/- 5%       |
| C207             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C208             | 2113901C75        | Cap Chip High Q 470 pF +/- 5%      |
| C209             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C210 thru 211    | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C212             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C250 thru 253    | 2109553T52        | Cap Ceramic 39pF +/-5%             |
| C255             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C256 thru 257    | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C258 thru 259    | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C260             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C261             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C297             | 2113951B34        | Cap NPO 10.0pF +/- 5% 250V HI Freq |
| C298 thru 299    | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C3               | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C300             | 2113951A52        | Cap NPO 68.0pF +/-5% 250V HI Freq  |
| C301 thru 302    | 2113951A34        | Cap NPO 10.0pF +/-5% 250V HI Freq  |
| C303 thru 304    | 2113951A42        | Cap NPO 27.0pF +/-5% 250V HI Freq  |
| C305             | 2113951B58        | Cap NPO High Freq 120 +/- 5% 250V  |
| C306             | 2113901C49        | Cap Chip High Q 43 pF +/- 5%       |
| C307             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C308             | 2113901C75        | Cap Chip High Q 470 pF +/- 5%      |
| C309             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C310 thru 311    | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C312             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C350 thru 353    | 2109553T52        | Cap Ceramic 39pF +/-5%             |
| C355             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C356 thru 357    | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C358             | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C359             | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C360             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C361             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C397             | 2113951B34        | Cap NPO 10.0pF +/- 5% 250V HI Freq |

# Parts List

## CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE SYMBOL                     | MOTOROLA PART NO. | DESCRIPTION                          |
|--------------------------------------|-------------------|--------------------------------------|
| C398 thru 399                        | 2182967Y54        | Chip Cap 68pF Ultra Low ESR          |
| C40                                  | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| C42                                  | 2113901C34        | Cap Chip High Q 15 pF +/- 5%         |
| C43 thru 44                          | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| C50                                  | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| C52                                  | 2113901C36        | Cap Chip High Q 18 pF +/- 5%         |
| C53 thru 54                          | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| <b>FERRITE BEADS:</b>                |                   |                                      |
| E100                                 | 2484657R01        | Inductor Bead Chip                   |
| E150                                 | 2484657R01        | Inductor Bead Chip                   |
| E200                                 | 2484657R01        | Inductor Bead Chip                   |
| E250                                 | 2484657R01        | Inductor Bead Chip                   |
| E300                                 | 2484657R01        | Inductor Bead Chip                   |
| E360                                 | 2484657R01        | Inductor Bead Chip                   |
| <b>COIL, INDUCTOR:</b>               |                   |                                      |
| L1                                   | 2462587X61        | Inductor Chip Low-profile 470 NH 5%  |
| L100                                 | 2484562T08        | Coil Surface Mount Air Wound         |
| L101                                 | 2484562T04        | Coil Surface Mount Air Wound         |
| L102                                 | 2484562T05        | Coil Surface Mount Air Wound         |
| L150                                 | 2483070X01        | Coil SM Air Wound                    |
| L151                                 | 2485873L02        | Encapsulated Air Wound 25nH          |
| L153                                 | 2485873L01        | Encapsulated Air Wound Coil          |
| L199                                 | 2484562T01        | Coil Surface Mount Air Wound         |
| L200                                 | 2484562T08        | Coil Surface Mount Air Wound         |
| L201                                 | 2484562T04        | Coil Surface Mount Air Wound         |
| L202                                 | 2484562T05        | Coil Surface Mount Air Wound         |
| L250                                 | 2483070X01        | Coil Sm Air Wound                    |
| L251                                 | 2485873L02        | Encapsulated Air Wound 25nH          |
| L253                                 | 2485873L01        | Encapsulated Air Wound Coil          |
| L299                                 | 2484562T01        | Coil Surface Mount Air Wound         |
| L300                                 | 2484562T08        | Coil Surface Mount Air Wound         |
| L301                                 | 2484562T04        | Coil Surface Mount Air Wound         |
| L302                                 | 2484562T05        | Coil Surface Mount Air Wound         |
| L350                                 | 2483070X01        | Coil SM Air Wound                    |
| L351                                 | 2485873L02        | Encapsulated Air Wound 25NH          |
| L353                                 | 2485873L01        | Encapsulated Air Wound Coil          |
| L399                                 | 2484562T01        | Coil Surface Mount Air Wound         |
| L40 thru 48                          | 2486015Y01        | Coil,AWC, 49.63, Top Hat             |
| L50 thru 58                          | 2486015Y01        | Coil,AWC, 49.63, Top Hat             |
| M1 thru 3                            | 1084806Y01        | PREFORM, 9 X 19 MM INT Flux          |
| <b>TRANSISTOR: (SEE NOTE)</b>        |                   |                                      |
| Q1                                   | 4888606T04        | XSTR,FET RF Power,N,SM,TO-272,900MHZ |
| Q2                                   | 4888606T04        | XSTR,FET RF Power,N,SM,TO-272,900MHZ |
| Q3                                   | 4888606T04        | XSTR,FET RF Power,N,SM,TO-272,900MHZ |
| Q4                                   | 5183513Y01        | MMIC,HFLINEAR,GAAS                   |
| Q5                                   | 4813824A10        | TSTR NPN 40V .2A GEN PURP            |
| Q6                                   | 4813824A17        | XSTR PNP40V .2A GENP B=100-300       |
| Q7                                   | 4813824A10        | TSTR NPN 40V .2A GEN PURP            |
| <b>RESISTOR, FIXED: ±5%; 1/16 W:</b> |                   |                                      |
| R1                                   | 0662057A47        | Chip Res 820 Ohms 5%                 |
| R10                                  | 0662057P02        | Res. Chip 15K 1% 30X60               |
| R100                                 | 0662057A51        | Chip Res 1200 Ohms 5%                |
| R101                                 | 0611079A70        | Res Fixed Chip 680 5 1/10W A/P       |
| R102                                 | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P       |
| R103                                 | 0611079A01        | Res Fixed Chip O 5 1/10W A/P         |

## CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                      |
|---------------------------------------|-------------------|----------------------------------|
| R104                                  | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R105                                  | 0662057A32        | Chip Res 200 Ohms 5%             |
| R11                                   | 0662057P95        | Res Chip 100.0K 1% 30X60         |
| R12                                   | 0662057P95        | Res Chip 100.0K 1% 30X60         |
| R13                                   | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P   |
| R199                                  | 0611079A20        | Res Fixed Chip 5.6 5 1/10W A/P   |
| R2                                    | 0662057B66        | Chip Res 5.6 Ohms 5%             |
| R200                                  | 0662057A51        | Chip Res 1200 Ohms 5%            |
| R201                                  | 0611079A70        | Res Fixed Chip 680 5 1/10W A/P   |
| R202                                  | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P   |
| R203                                  | 0611079A01        | Res Fixed Chip O 5 1/10W A/P     |
| R204                                  | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R205                                  | 0662057A32        | Cap 200 Ohms 5%                  |
| R299                                  | 0611079A20        | Res Fixed Chip 5.6 5 1/10W A/P   |
| R3                                    | 0662057A47        | Chip Res 820 Ohms 5%             |
| R300                                  | 0662057A51        | Chip Res 1200 Ohms 5%            |
| R301                                  | 0611079A70        | Res Fixed Chip 680 5 1/10W A/P   |
| R302                                  | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P   |
| R303                                  | 0611079A01        | Res Fixed Chip O 5 1/10W A/P     |
| R304                                  | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R305                                  | 0662057A32        | Chip Res 200 Ohms 5%             |
| R399                                  | 0611079A20        | Res Fixed Chip 5.6 5 1/10W A/P   |
| R4                                    | 0683962T31        | Res Chip 18 5-1                  |
| R40 thru 42                           | 0611072A18        | Res Chip 51 5 1/4                |
| R43                                   | 0611077A01        | Res Chip JUMPER                  |
| R50 thru 52                           | 0684899Y01        | Res Chip 50 OHM 30W +-5%         |
| R54                                   | 0611077A01        | Res Chip Jumper                  |
| R6                                    | 0611077A61        | Res Chip 300 5 1/8W              |
| R7                                    | 0662057A32        | Chip Res 200 Ohms 5%             |
| R8                                    | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P   |
| R99                                   | 0611079A64        | Res Fixed Chip 390 5 1/10W A/P   |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |                                  |
| U1                                    | 5113816A10        | REG 15V POS 500MA<br>MC78M15BDRK |
| <b>VOLTAGE REGULATOR: (SEE NOTE)</b>  |                   |                                  |
| VR1                                   | 4813830A11        | Diode 3.9V 5% 225MW MMBZ5228B_   |
| VR2                                   | 4813830A22        | Diode 9.1V 5% 225MW MMBZ5239B_   |
| <b>CABLE ASSEMBLY:</b>                |                   |                                  |
| W1                                    | 4280500F01        | T & R VER OF 4282981X01          |
| W11 thru 12                           | 4280500F01        | T & R VER OF 4282981X01          |
| W2 thru 9                             | 4280500F01        | T & R VER OF 4282981X01          |
| <b>NON-REFERENCED ITEMS</b>           |                   |                                  |
|                                       | 0310943J09        | SCRTPG TT3X0.5X6 INTSTARPAN      |
|                                       | 3284948Y07        | Pad, Thermal VHF                 |
|                                       | 5482006W02        | Ribbon Thermal XFER              |
|                                       | 5482006W03        | Barcode Label                    |
|                                       | 6484935Y01        | Plate,spacer                     |

## CLN8151A (MTR2000 VHF Hardware Kit)

|                             |            |                                    |
|-----------------------------|------------|------------------------------------|
| <b>NON-REFERENCED ITEMS</b> |            |                                    |
|                             | 0310907A19 | SCRMCH M3X0.5X8 INTSTARPAN STL     |
|                             | 0310907A40 | SCRMCH(M4X0.7X25) STRPANSTL-CAD    |
|                             | 0310907C66 | SCRMCH M4X0.7X45MM STLCAD          |
|                             | 0310917A51 | SCRMCH M3.5X0.6X12 STPN STLZNC     |
|                             | 0984169Y01 | Connector, Recept "N" Cast Housing |
|                             | 1383852R01 | Grille Fan                         |
|                             | 1582626X02 | Cover PA & PS Casting              |

## Parts List

### CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                    |
|------------------|-------------------|--------------------------------|
|                  | 2182805H05        | Cap Cer Feedthru 1000 GMV X5U  |
|                  | 2682624X11        | Heat Sink High Power PA        |
|                  | 3082728X05        | Cable 6-Wire                   |
|                  | 3282610Y01        | Gasket RF                      |
|                  | 5482624Y01        | Label Thermal Xfer Wht Polysty |
|                  | 5483323X01        | Label, Freq. Ref.              |
|                  | 5983663R09        | Fan DC 1" THK X120MMX120MM     |

### TFD6560A (Lowpass Filter And Final Coupler)

|  |            |                                |
|--|------------|--------------------------------|
| BC1  | 5487704C01 | Label 2D Matrix                |
| <b>CAPACITOR, FIXED: <math>\mu\text{F} \pm 10\%</math>; 100 V:</b> |            |                                |
| UNLESS OTHERWISE STATED  |            |                                |
| C4000 thru 4001  | 2183785X03 | Cap Mica 7pF .5% 250V          |
| C4002  | 2183785X07 | Cap Mica 25pF 5% 250V          |
| C4003  | 2183785X03 | Cap Mica 7pF .5% 250V          |
| C4004  | 2183785X07 | Cap Mica 25pF 5% 250V          |
| C4005  | 2183785X02 | Cap Mica 6pF 5% 250V SM        |
| C4006  | 2183785X04 | Cap Mica 10pF 5% 250V          |
| C4008  | 2113740B49 | Cap Chip Reel CL1 +/-30 100    |
| C4010  | 2113740B49 | Cap Chip Reel CL1 +/-30 100    |
| <b>DIODE: (SEE NOTE)</b>   |            |                                |
| CR4000   | 4882290T04 | Diode SI Hot Carrier HSMS 2812 |
| CR4001   | 4882290T04 | Diode SI Hot Carrier HSMS 2812 |
| <b>COIL, INDUCTOR:</b>   |            |                                |
| L4000 thru 4002  | 2480502F07 | Coil                           |
| L4003  | 2411087A20 | Coil Chip .33 UH 10 A/P        |
| L4004  | 2411087A22 | Coil Chip .47 UH 10 A/P        |
| L4005  | 2411087A02 | Coil Chip .010 UH 10 A/P       |
| L4006  | 2411087A20 | Coil Chip .33 UH 10 A/P        |
| L4007  | 2411087A22 | Coil Chip .47 UH 10 A/P        |
| L4008  | 2485873L08 | Coil Air Wound Epoxy 8.01NH    |
| <b>CABLE ASSEMBLY:</b>   |            |                                |
| W4000 thru 4007  | 4280500F01 | T & R VER OF 4282981X01        |
| <b>NON-REFERENCED ITEMS</b>  |            |                                |
|  | 5685345U01 | Box Hybrid ESD                 |
|  | 8484842T03 | Substrate                      |

### TTN5238A (Circulator Load)

|                        |            |                              |
|------------------------|------------|------------------------------|
|                        | 4385035U02 | Flange Circulator Load (VHF) |
|                        | 5685345U01 | Box Hybrid ESD               |
|                        | 8485231U04 | Substrate, Resistor Load     |
| BC1                    | 5487704C01 | Label 2D Matrix              |
| <b>CABLE ASSEMBLY:</b> |            |                              |
| W4900                  | 4280500F01 | T & R VER OF 4282981X01      |

**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

### CLD1301A 100W PA Module (132 to 154MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION |
|------------------|-------------------|-------------|
|------------------|-------------------|-------------|

# Parts List

## CLD1300A 100W PA Module (150 to 174MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION |
|------------------|-------------------|-------------|
|------------------|-------------------|-------------|

### CLD1300A (Top Level Kits)

|            |                                     |
|------------|-------------------------------------|
| 4280500F01 | T & R Version of 4282981X01         |
| 5884911T29 | Circulator 200W 150-174MHZ          |
| CLD6099A   | VHF R2 100W Output Board MTR2000    |
| CLD6096A   | MTR2000 VHF Input DC Board          |
| CLD6097A   | Quantar/MTR2000 VHF Final Module R2 |
| CLN8151A   | MTR2000 VHF Hardware Kit            |
| TFD6560A   | Lowpass Filter And Final Coupler    |
| TTN5238A   | Circulator Load                     |

### CLD6096A (Input Board R1)

**CAPACITOR, FIXED:  $\mu\text{F}$   $\pm 10\%$ ; 100 V:**  
UNLESS OTHERWISE STATED

|                 |            |   |
|-----------------|------------|---|
| C4100           | 2113741A37 | Cap Chip CL2 X7R Reel 4700                                    |
| C4104           | 2109822S06 | Cap Chip Cer 10uF 16V   |
| C4107 thru 4108 | 2113740A71 | Cap Chip Reel CL1 +/-30 470                                   |
| C4109           | 2109822S06 | Cap Chip Cer 10uF 16V   |
| C4110           | 2113740A71 | Cap Chip Reel CL1 +/-30 470                                   |
| C4112           | 2113740A79 | Cap Chip Reel CL1 +/-30 1000                                  |
| C4113           | 2113740A71 | Cap Chip Reel CL1 +/-30 470                                   |
| D4100           | 4813833C05 | Diode,RECT,BAV99L,,TO-236AB,715MA,,.225W,,DL 70V A7X BAV99LT1 |

**DIODE: (SEE NOTE)**

|       |            |   |
|-------|------------|---|
| D4101 | 4813833C05 | Diode,RECT,BAV99L,,TO-236AB,715MA,,.225W,,DL 70V A7X BAV99LT1 |
|-------|------------|---|

**CONNECTOR, RECEPTACLE:**

|       |            |                              |
|-------|------------|------------------------------|
| J2101 | 0982492W01 | BNC CONN PCB VERTICAL RECEPT |
| J2102 | 2884490T03 | HDR 2X3 VERT PWR             |

**TRANSISTOR: (SEE NOTE)**

|       |            |                           |
|-------|------------|---------------------------|
| Q4100 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |
| Q4101 | 4813822A09 | TSTR PNP 40V 3A MJD32T4   |
| Q4102 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |
| Q4103 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |

**RESISTOR, FIXED:  $\pm 5\%$ ; 1/16 W:**  
UNLESS OTHERWISE STATED

|                 |            |                                |
|-----------------|------------|--------------------------------|
| R4100 thru 4101 | 0611079A60 | Res Fixed Chip 270 5 1/10W A/P |
| R4102           | 0611079A01 | Res Fixed Chip O 5 1/10W A/P   |
| R4103           | 0683962T01 | Res Chip 1.0 5-1               |
| R4104           | 0611072A49 | Res Chip 1000 5 1/4            |
| R4105           | 0611079A84 | Res Fixed Chip 2700 5 1/10 A/P |
| R4106           | 0611079A72 | Res Fixed Chip 820 5 1/10W A/P |
| R4107           | 0611079A98 | Res Fixed Chip 10K 5 1/10 A/P  |
| R4108 thru 4109 | 0611072A49 | Res Chip 1000 5 1/4            |
| R4110           | 0611079A74 | Res Fixed Chip 1000 5 1/10 A/P |
| R4111           | 0611079A20 | Res Fixed Chip 5.6 5 1/10W A/P |
| R4112           | 0611079A98 | Res Fixed Chip 10K 5 1/10 A/P  |
| R4113           | 0611079A72 | Res Fixed Chip 820 5 1/10W A/P |
| R4115           | 0611072A35 | Res Chip 270 5 1/4             |
| R4116           | 0611079A74 | Res Fixed Chip 1000 5 1/10 A/P |
| R4118           | 0611079A01 | Res Fixed Chip O 5 1/10W A/P   |

**NON-REFERENCED ITEMS**

|            |                             |
|------------|-----------------------------|
| 5482006W03 | Barcode Label               |
| 5484960T02 | BLank Barcode Label for KVL |
| 8484944Y01 | PWB, DC DIST, Input, PA     |

## CLD1300A 100W PA Module (150 to 174MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION |
|------------------|-------------------|-------------|
|------------------|-------------------|-------------|

### CLD6099A (Output Board R2)

**CAPACITOR, FIXED:  $\mu\text{F}$   $\pm 10\%$ ; 100 V:**  
UNLESS OTHERWISE STATED

|                        |            |                             |
|------------------------|------------|-----------------------------|
| C4501                  | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4502                  | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4503, C4505 thru 4506 | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4508 thru 4509        | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4509                  | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4510                  | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4512                  | 2113741A61 | Cap Chip CL2 X7R REEL 47000 |
| C4514                  | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4518 thru 4520        | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4521                  | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4522                  | 2311049A45 | Cap Tant Chip 10 10 35      |
| C4523 thru 4526        | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4527 thru 4529        | 2113741A61 | Cap Chip CL2 X7R REEL 47000 |
| C4530                  | 2311049A21 | Cap Tant Chip 22 10 20 A/P  |
| C4531 thru 4532        | 2113741A61 | Cap Chip CL2 X7R REEL 47000 |
| C4533 thru 4536        | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4537 thru 4538        | 2311049A45 | Cap Tant Chip 10 10 35      |
| C4539 thru 4541        | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4543 thru 4544        | 2113901C75 | Cap Chip HI Q 470 PF +/- 5% |
| C4546                  | 2113740A55 | Cap Chip Reel CL1 +/-30 100 |
| C4547                  | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4548                  | 2113901C75 | Cap Chip HI Q 470 PF +/- 5% |
| C4549                  | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4550 thru 4552        | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |
| C4553                  | 2380090M36 | Cap 100 uF 25V              |
| C4555 thru 4558        | 2113740A71 | Cap Chip Reel CL1 +/-30 470 |
| C4559                  | 2113901C52 | Cap Chip HI Q 56 PF +/- 5%  |
| C4569                  | 2113901C75 | Cap Chip HI Q 470 PF +/- 5% |
| C4570 thru 4578        | 2113740A27 | Cap Chip Reel CL1 +/-30 8.2 |
| C4579 thru 4580        | 2113901C75 | Cap Chip HI Q 470 PF +/- 5% |
| C4580                  | 2113901C75 | Cap Chip HI Q 470 PF +/- 5% |
| C4585                  | 2113740F51 | Cap Chip Reel CL1 +/-30 100 |

**DIODE: (SEE NOTE)**

|        |            |                             |
|--------|------------|-----------------------------|
| CR4501 | 4813833C02 | DIODE DUAL 70V 5B COMM CATH |
|--------|------------|-----------------------------|

**CONNECTOR, RECEPTACLE:**

|       |            |                           |
|-------|------------|---------------------------|
| J4501 | 2884490T03 | Header 2X3 Vertical Power |
| J4502 | 2884490T03 | Header 2X3 Vertical Power |

**CONNECTOR, PLUG:**

|       |            |                         |
|-------|------------|-------------------------|
| J4503 | 2885155U01 | Plug Header 10 Contacts |
|-------|------------|-------------------------|

**COIL, INDUCTOR:**

|                 |            |                                     |
|-----------------|------------|-------------------------------------|
| L4501 thru 4505 | 2462587X61 | Inductor Chip Low-profile 470 nH 5% |
| L4507 thru 4508 | 2462587X61 | Inductor Chip Low-profile 470 nH 5% |
| L4511 thru 4514 | 2484657R01 | Inductor Bead Chip                  |
| L4515 thru 4521 | 2462587X55 | Inductor Chip Low-profile 150 nH 5% |
| L4522           | 2462587X61 | Inductor Chip Low-profile 470 nH 5% |
| L4523 thru 4524 | 2462587X55 | Inductor Chip Low-profile 150 nH 5% |

**TRANSISTOR: (SEE NOTE)**

|       |            |                           |
|-------|------------|---------------------------|
| Q4502 | 4813824A10 | TSTR NPN 40V .2A GEN PURP |
| Q4503 | 4813821A09 | TSTR P-CH 60V 12A _2955_  |

**RESISTOR, FIXED:  $\pm 5\%$ ; 1/16 W:**  
UNLESS OTHERWISE STATED

|       |            |                              |
|-------|------------|------------------------------|
| R4501 | 0662057A83 | Chip Res 27K Ohms 5%         |
| R4507 | 0662057Z16 | Res Chip 3.92 K Ohms         |
| R4508 | 0662057T59 | Chip Res 3.32K Ohms 1%       |
| R4509 | 0611079F74 | Res Chip 5.76K 1/10W 1% 0805 |

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CLD1300A 100W PA Module (150 to 174MHz)

| REFERENCE SYMBOL               | MOTOROLA PART NO. | DESCRIPTION                      |
|--------------------------------|-------------------|----------------------------------|
| R4510                          | 0662057A89        | Chip Res 47K Ohms 5%             |
| R4511                          | 0662057A53        | Chip Res 1500 Ohms 5%            |
| R4513                          | 0662057A97        | Chip Res 100K Ohms 5%            |
| R4514                          | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4515                          | 0662057A89        | Chip Res 47K Ohms 5%             |
| R4516                          | 0662057B47        | Chip Res 0 Ohms +/-0 50 Ohms     |
| R4517                          | 0662057A97        | Chip Res 100K Ohms 5%            |
| R4518                          | 0662057A69        | Chip Res 6800 Ohms 5%            |
| R4522                          | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4523                          | 0662057P02        | Res Chip 15K 1% 30X60            |
| R4525                          | 0662057A75        | Chip Res 12K Ohms 5%             |
| R4526                          | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4530                          | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4532                          | 0611077E94        | Res Chip 1000 1 1/8W             |
| R4536 thru 4537                | 0662057A83        | Chip Res 27K Ohms 5%             |
| R4538 thru 4539                | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4540 thru 4541                | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4542                          | 0611079G49        | Res Chip 31.6K 1/10W 1% 0805     |
| R4543                          | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4544                          | 0611079F74        | Res Chip 5.76K 1/10W 1% 0805     |
| R4545                          | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4546                          | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4547                          | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4548 thru 4550                | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4551                          | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4552 thru 4553                | 0683962T24        | Res Chip 9.1 5-1                 |
| R4554 thru 4555                | 0662057A89        | Chip Res 47K Ohms 5%             |
| R4556                          | 0662057A57        | Chip Res 2200 Ohms 5%            |
| R4557                          | 0662057A83        | Chip Res 27K Ohms 5%             |
| R4559                          | 0662057A75        | Chip Res 12K Ohms 5%             |
| R4560                          | 0662057A53        | Chip Res 1500 Ohms 5%            |
| R4562                          | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4563                          | 0682089V01        | SMT .01 2W                       |
| R4564                          | 0662057A53        | Chip Res 1500 Ohms 5%            |
| R4565                          | 0662057P10        | Res Chip 10.0K 1% 30X60          |
| R4566 thru 4567                | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4568 thru 4569                | 0662057B47        | Chip Res 0 Ohms +/-0 50 Ohms     |
| R4570                          | 0662057A49        | Chip Res 1000 Ohms 5%            |
| R4571                          | 0662057B47        | Chip Res 0 Ohms +/-0 50 Ohms     |
| R4577 thru 4578                | 0662057A97        | Chip Res 100K Ohms 5%            |
| THERMISTOR:                    |                   |                                  |
| RT4501                         | 0680149M02        | THERMISTOR CHIP 100K Ohms        |
| INTEGRATED CIRCUIT: (SEE NOTE) |                   |                                  |
| U4504                          | 5113816A07        | REG 5V POS 500MA<br>MC78M05BDTRK |
| U4505                          | 5113819A04        | IC QD OP AMP GEN PUR P MC3303D   |
| U4506                          | 5182374Y01        | IC A/D 8 BIT                     |
| U4507                          | 5180057S02        | IC CMOS CUST DA CONV 13" REEL    |
| U4508                          | 5113819A04        | IC QD OP AMP GEN PUR P MC3303D   |
| NON-REFERENCED ITEMS           |                   |                                  |
|                                | 5482006W03        | Barcode Label                    |
|                                | 5484960T02        | Blank Barcode Label For KVL      |
|                                | 8483244X05        | PCB,PA OUT,VHF,100W              |

CLD6097A (Final Module)

CAPACITOR, FIXED:  $\mu\text{F} \pm 10\%$ ; 100 V:

|               |            |                                   |
|---------------|------------|-----------------------------------|
| C1            | 2113740A79 | Cap Chip Reel CL1 +/-30 1000      |
| C100          | 2113951A52 | Cap NPO 68.0pF +/-5% 250V HI Freq |
| C101 thru 102 | 2113951A34 | Cap NPO 10.0pF +/-5% 250V HI Freq |

CLD1300A 100W PA Module (150 to 174MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                        |
|------------------|-------------------|------------------------------------|
| C103 thru 104    | 2113951A42        | Cap NPO 27.0pF +/-5% 250V HI Freq  |
| C105             | 2113951B58        | Cap NPO High Freq 120 +/- 5% 250V  |
| C106             | 2113901C49        | Cap Chip High Q 43 pF +/- 5%       |
| C107             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C108             | 2113901C75        | Cap Chip High Q 470 pF +/- 5%      |
| C109             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C110 thru 111    | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C112             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C150 thru 153    | 2109553T52        | Cap Ceramic 39pF +/-5%             |
| C155             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C156             | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C157             | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C158 thru 159    | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C160             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C161             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C197             | 2113951B34        | Cap NPO 10.0pF +/- 5% 250V HI Freq |
| C198             | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C199             | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C2               | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C200             | 2113951A52        | Cap NPO 68.0pF +/-5% 250V HI Freq  |
| C201 thru 202    | 2113951A34        | Cap NPO 10.0pF +/-5% 250V HI Freq  |
| C203 thru 204    | 2113951A42        | Cap NPO 27.0pF +/-5% 250V HI Freq  |
| C205             | 2113951B58        | Cap NPO High Freq 120 +/- 5% 250V  |
| C206             | 2113901C49        | Cap Chip High Q 43 pF +/- 5%       |
| C207             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C208             | 2113901C75        | Cap Chip High Q 470 pF +/- 5%      |
| C209             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C210 thru 211    | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C212             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C250 thru 253    | 2109553T52        | Cap Ceramic 39pF +/-5%             |
| C255             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C256 thru 257    | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C258 thru 259    | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C260             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C261             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C297             | 2113951B34        | Cap NPO 10.0pF +/- 5% 250V HI Freq |
| C298 thru 299    | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C3               | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C300             | 2113951A52        | Cap NPO 68.0pF +/-5% 250V HI Freq  |
| C301 thru 302    | 2113951A34        | Cap NPO 10.0pF +/-5% 250V HI Freq  |
| C303 thru 304    | 2113951A42        | Cap NPO 27.0pF +/-5% 250V HI Freq  |
| C305             | 2113951B58        | Cap NPO High Freq 120 +/- 5% 250V  |
| C306             | 2113901C49        | Cap Chip High Q 43 pF +/- 5%       |
| C307             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C308             | 2113901C75        | Cap Chip High Q 470 pF +/- 5%      |
| C309             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C310 thru 311    | 2113740A79        | Cap Chip Reel CL1 +/-30 1000       |
| C312             | 2113741M69        | Cap Chip CLS2 100000pF 50V 10%     |
| C350 thru 353    | 2109553T52        | Cap Ceramic 39pF +/-5%             |
| C355             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C356 thru 357    | 2109553T40        | Cap Ceramic 12pF +/-5%             |
| C358             | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C359             | 2109553T78        | Cap Ceramic 470pF +/-5%            |
| C360             | 2109822S04        | Cap Chip Cer 10uF 35V 2220         |
| C361             | 2182967Y57        | Cap,Chip,91pF,5%,500V              |
| C397             | 2113951B34        | Cap NPO 10.0pF +/- 5% 250V HI Freq |
| C398 thru 399    | 2182967Y54        | Chip Cap 68pF Ultra Low ESR        |
| C40              | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF    |

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**CLD1300A 100W PA Module (150 to 174MHz)**

| REFERENCE SYMBOL                     | MOTOROLA PART NO. | DESCRIPTION                          |
|--------------------------------------|-------------------|--------------------------------------|
| C42                                  | 2113901C34        | Cap Chip High Q 15 pF +/- 5%         |
| C43 thru 44                          | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| C50                                  | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| C52                                  | 2113901C36        | Cap Chip High Q 18 pF +/- 5%         |
| C53 thru 54                          | 2113901C29        | Cap Chip High Q 10 pF +/-0.50pF      |
| <b>FERRITE BEADS:</b>                |                   |                                      |
| E100                                 | 2484657R01        | Inductor Bead Chip                   |
| E150                                 | 2484657R01        | Inductor Bead Chip                   |
| E200                                 | 2484657R01        | Inductor Bead Chip                   |
| E250                                 | 2484657R01        | Inductor Bead Chip                   |
| E300                                 | 2484657R01        | Inductor Bead Chip                   |
| E360                                 | 2484657R01        | Inductor Bead Chip                   |
| <b>COIL, INDUCTOR:</b>               |                   |                                      |
| L1                                   | 2462587X61        | Inductor Chip Low-profile 470 NH 5%  |
| L100                                 | 2484562T08        | Coil Surface Mount Air Wound         |
| L101                                 | 2484562T04        | Coil Surface Mount Air Wound         |
| L102                                 | 2484562T05        | Coil Surface Mount Air Wound         |
| L150                                 | 2483070X01        | Coil SM Air Wound                    |
| L151                                 | 2485873L02        | Encapsulated Air Wound 25nH          |
| L153                                 | 2485873L01        | Encapsulated Air Wound Coil          |
| L199                                 | 2484562T01        | Coil Surface Mount Air Wound         |
| L200                                 | 2484562T08        | Coil Surface Mount Air Wound         |
| L201                                 | 2484562T04        | Coil Surface Mount Air Wound         |
| L202                                 | 2484562T05        | Coil Surface Mount Air Wound         |
| L250                                 | 2483070X01        | Coil Sm Air Wound                    |
| L251                                 | 2485873L02        | Encapsulated Air Wound 25nH          |
| L253                                 | 2485873L01        | Encapsulated Air Wound Coil          |
| L299                                 | 2484562T01        | Coil Surface Mount Air Wound         |
| L300                                 | 2484562T08        | Coil Surface Mount Air Wound         |
| L301                                 | 2484562T04        | Coil Surface Mount Air Wound         |
| L302                                 | 2484562T05        | Coil Surface Mount Air Wound         |
| L350                                 | 2483070X01        | Coil SM Air Wound                    |
| L351                                 | 2485873L02        | Encapsulated Air Wound 25NH          |
| L353                                 | 2485873L01        | Encapsulated Air Wound Coil          |
| L399                                 | 2484562T01        | Coil Surface Mount Air Wound         |
| L40 thru 48                          | 2486015Y01        | Coil,AWC, 49.63, Top Hat             |
| L50 thru 58                          | 2486015Y01        | Coil,AWC, 49.63, Top Hat             |
| M1 thru 3                            | 1084806Y01        | PREFORM, 9 X 19 MM INT Flux          |
| <b>TRANSISTOR: (SEE NOTE)</b>        |                   |                                      |
| Q1                                   | 4888606T04        | XSTR,FET RF Power,N,SM,TO-272,900MHZ |
| Q2                                   | 4888606T04        | XSTR,FET RF Power,N,SM,TO-272,900MHZ |
| Q3                                   | 4888606T04        | XSTR,FET RF Power,N,SM,TO-272,900MHZ |
| Q4                                   | 5183513Y01        | MMIC,HFLINEAR,GAAS                   |
| Q5                                   | 4813824A10        | TSTR NPN 40V .2A GEN PURP            |
| Q6                                   | 4813824A17        | XSTR PNP40V .2A GENP B=100-300       |
| Q7                                   | 4813824A10        | TSTR NPN 40V .2A GEN PURP            |
| <b>RESISTOR, FIXED: ±5%; 1/16 W:</b> |                   |                                      |
| R1                                   | 0662057A47        | Chip Res 820 Ohms 5%                 |
| R10                                  | 0662057P02        | Res. Chip 15K 1% 30X60               |
| R100                                 | 0662057A51        | Chip Res 1200 Ohms 5%                |
| R101                                 | 0611079A70        | Res Fixed Chip 680 5 1/10W A/P       |
| R102                                 | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P       |
| R103                                 | 0611079A01        | Res Fixed Chip O 5 1/10W A/P         |
| R104                                 | 0662057A49        | Chip Res 1000 Ohms 5%                |
| R105                                 | 0662057A32        | Chip Res 200 Ohms 5%                 |

**CLD1300A 100W PA Module (150 to 174MHz)**

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                       |
|---------------------------------------|-------------------|-----------------------------------|
| R11                                   | 0662057P95        | Res Chip 100.0K 1% 30X60          |
| R12                                   | 0662057P95        | Res Chip 100.0K 1% 30X60          |
| R13                                   | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P    |
| R199                                  | 0611079A20        | Res Fixed Chip 5.6 5 1/10W A/P    |
| R2                                    | 0662057B66        | Chip Res 5.6 Ohms 5%              |
| R200                                  | 0662057A51        | Chip Res 1200 Ohms 5%             |
| R201                                  | 0611079A70        | Res Fixed Chip 680 5 1/10W A/P    |
| R202                                  | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P    |
| R203                                  | 0611079A01        | Res Fixed Chip O 5 1/10W A/P      |
| R204                                  | 0662057A49        | Chip Res 1000 Ohms 5%             |
| R205                                  | 0662057A32        | Cap 200 Ohms 5%                   |
| R299                                  | 0611079A20        | Res Fixed Chip 5.6 5 1/10W A/P    |
| R3                                    | 0662057A47        | Chip Res 820 Ohms 5%              |
| R300                                  | 0662057A51        | Chip Res 1200 Ohms 5%             |
| R301                                  | 0611079A70        | Res Fixed Chip 680 5 1/10W A/P    |
| R302                                  | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P    |
| R303                                  | 0611079A01        | Res Fixed Chip O 5 1/10W A/P      |
| R304                                  | 0662057A49        | Chip Res 1000 Ohms 5%             |
| R305                                  | 0662057A32        | Chip Res 200 Ohms 5%              |
| R399                                  | 0611079A20        | Res Fixed Chip 5.6 5 1/10W A/P    |
| R4                                    | 0683962T31        | Res Chip 18 5-1                   |
| R40 thru 42                           | 0611072A18        | Res Chip 51 5 1/4                 |
| R43                                   | 0611077A01        | Res Chip JUMPER                   |
| R50 thru 52                           | 0684899Y01        | Res Chip 50 Ohms 30W +-5%         |
| R54                                   | 0611077A01        | Res Chip Jumper                   |
| R6                                    | 0611077A61        | Res Chip 300 5 1/8W               |
| R7                                    | 0662057A32        | Chip Res 200 Ohms 5%              |
| R8                                    | 0611079A90        | Res Fixed Chip 4700 5 1/10 A/P    |
| R99                                   | 0611079A64        | Res Fixed Chip 390 5 1/10W A/P    |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |                                   |
| U1                                    | 5113816A10        | REG 15V POS 500MA<br>MC78M15BDTRK |
| <b>VOLTAGE REGULATOR: (SEE NOTE)</b>  |                   |                                   |
| VR1                                   | 4813830A11        | Diode 3.9V 5% 225MW MMBZ5228B_    |
| VR2                                   | 4813830A22        | Diode 9.1V 5% 225MW MMBZ5239B_    |
| <b>CABLE ASSEMBLY:</b>                |                   |                                   |
| W1                                    | 4280500F01        | T & R VER OF 4282981X01           |
| W11 thru 12                           | 4280500F01        | T & R VER OF 4282981X01           |
| W2 thru 9                             | 4280500F01        | T & R VER OF 4282981X01           |
| <b>NON-REFERENCED ITEMS</b>           |                   |                                   |
|                                       | 0310943J09        | SCRTPG TT3X0.5X6 INTSTARPAN       |
|                                       | 3284948Y07        | Pad, Thermal VHF                  |
|                                       | 5482006W02        | Ribbon Thermal XFER               |
|                                       | 5482006W03        | Barcode Label                     |
|                                       | 6484935Y01        | Plate,spacer                      |

**CLN8151A (MTR2000 VHF Hardware Kit)**

|                             |            |                                    |
|-----------------------------|------------|------------------------------------|
| <b>NON-REFERENCED ITEMS</b> |            |                                    |
|                             | 0310907A19 | SCRMCH M3X0.5X8 INTSTARPAN STL     |
|                             | 0310907A40 | SCRMCH(M4X0.7X25) STRPANSTL-CAD    |
|                             | 0310907C66 | SCRMCH M4X0.7X45MM STL CAD         |
|                             | 0310917A51 | SCRMCH M3.5X0.6X12 STPN STLZNC     |
|                             | 0984169Y01 | Connector, Recept "N" Cast Housing |
|                             | 1383852R01 | Grille Fan                         |
|                             | 1582626X02 | Cover PA & PS Casting              |
|                             | 2182805H05 | Cap Cer Feedthru 1000 GMV X5U      |
|                             | 2682624X11 | Heat Sink High Power PA            |

**68P81094E13-D**  
**Parts List (Sheet 15 of 16)**  
**06/30/06**

CLD1300A 100W PA Module (150 to 174MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                    |
|------------------|-------------------|--------------------------------|
|                  | 3082728X05        | Cable 6-Wire                   |
|                  | 3282610Y01        | Gasket RF                      |
|                  | 5482624Y01        | Label Thermal Xfer Wht Polystr |
|                  | 5483323X01        | Label, Freq. Ref.              |
|                  | 5983663R09        | Fan DC 1" THK X120MMX120MM     |

CLD1300A 100W PA Module (150 to 174MHz)

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION |
|------------------|-------------------|-------------|
|------------------|-------------------|-------------|

TFD6560A (Lowpass Filter And Final Coupler)

|  |            |                                |
|--|------------|--------------------------------|
| BC1  | 5487704C01 | Label 2D Matrix                |
| CAPACITOR, FIXED: $\mu$ F $\pm$ 10%; 100 V:<br>UNLESS OTHERWISE STATED |            |                                |
| C4000 thru 4001  | 2183785X03 | Cap Mica 7pF .5% 250V          |
| C4002  | 2183785X07 | Cap Mica 25pF 5% 250V          |
| C4003  | 2183785X03 | Cap Mica 7pF .5% 250V          |
| C4004  | 2183785X07 | Cap Mica 25pF 5% 250V          |
| C4005  | 2183785X02 | Cap Mica 6pF 5% 250V SM        |
| C4006  | 2183785X04 | Cap Mica 10pF 5% 250V          |
| C4008  | 2113740B49 | Cap Chip Reel CL1 +/-30 100    |
| C4010  | 2113740B49 | Cap Chip Reel CL1 +/-30 100    |
| DIODE: (SEE NOTE)  |            |                                |
| CR4000   | 4882290T04 | Diode SI Hot Carrier HSMS 2812 |
| CR4001   | 4882290T04 | Diode SI Hot Carrier HSMS 2812 |
| COIL, INDUCTOR:  |            |                                |
| L4000 thru 4002  | 2480502F07 | Coil                           |
| L4003  | 2411087A20 | Coil Chip .33 UH 10 A/P        |
| L4004  | 2411087A22 | Coil Chip .47 UH 10 A/P        |
| L4005  | 2411087A02 | Coil Chip .010 UH 10 A/P       |
| L4006  | 2411087A20 | Coil Chip .33 UH 10 A/P        |
| L4007  | 2411087A22 | Coil Chip .47 UH 10 A/P        |
| L4008  | 2485873L08 | Coil Air Wound Epoxy 8.01NH    |
| CABLE ASSEMBLY:  |            |                                |
| W4000 thru 4007  | 4280500F01 | T & R VER OF 4282981X01        |
| NON-REFERENCED ITEMS   |            |                                |
|  | 5685345U01 | Box Hybrid ESD                 |
|  | 8484842T03 | Substrate                      |

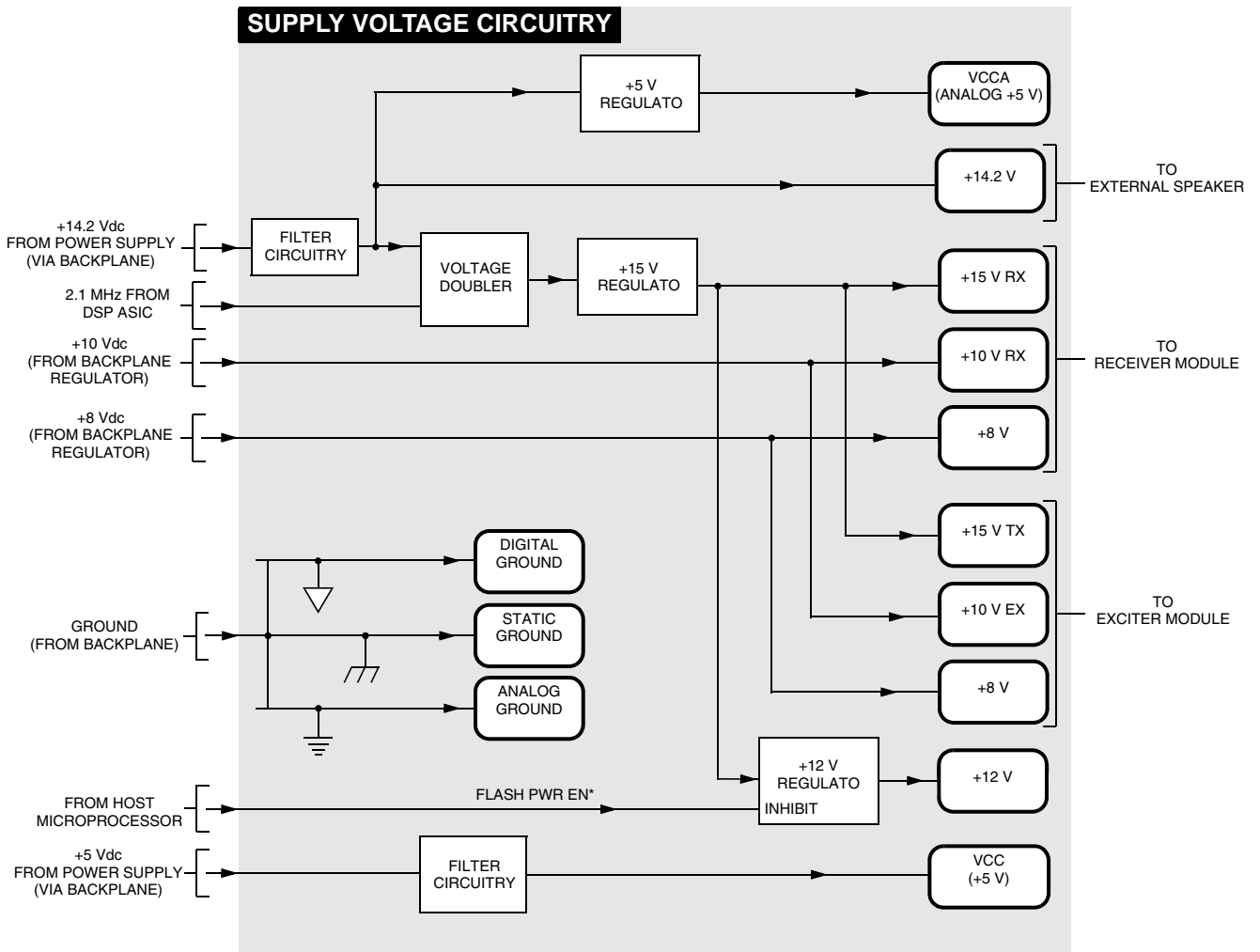
TTN5238A (Circulator Load)

|                 |            |                              |
|-----------------|------------|------------------------------|
|                 | 4385035U02 | Flange Circulator Load (VHF) |
|                 | 5685345U01 | Box Hybrid ESD               |
|                 | 8485231U04 | Substrate, Resistor Load     |
| BC1             | 5487704C01 | Label 2D Matrix              |
| CABLE ASSEMBLY: |            |                              |
| W4900           | 4280500F01 | T & R Version of 4282981X01  |

**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

# STATION CONTROL MODULE

MODEL TCN6273N



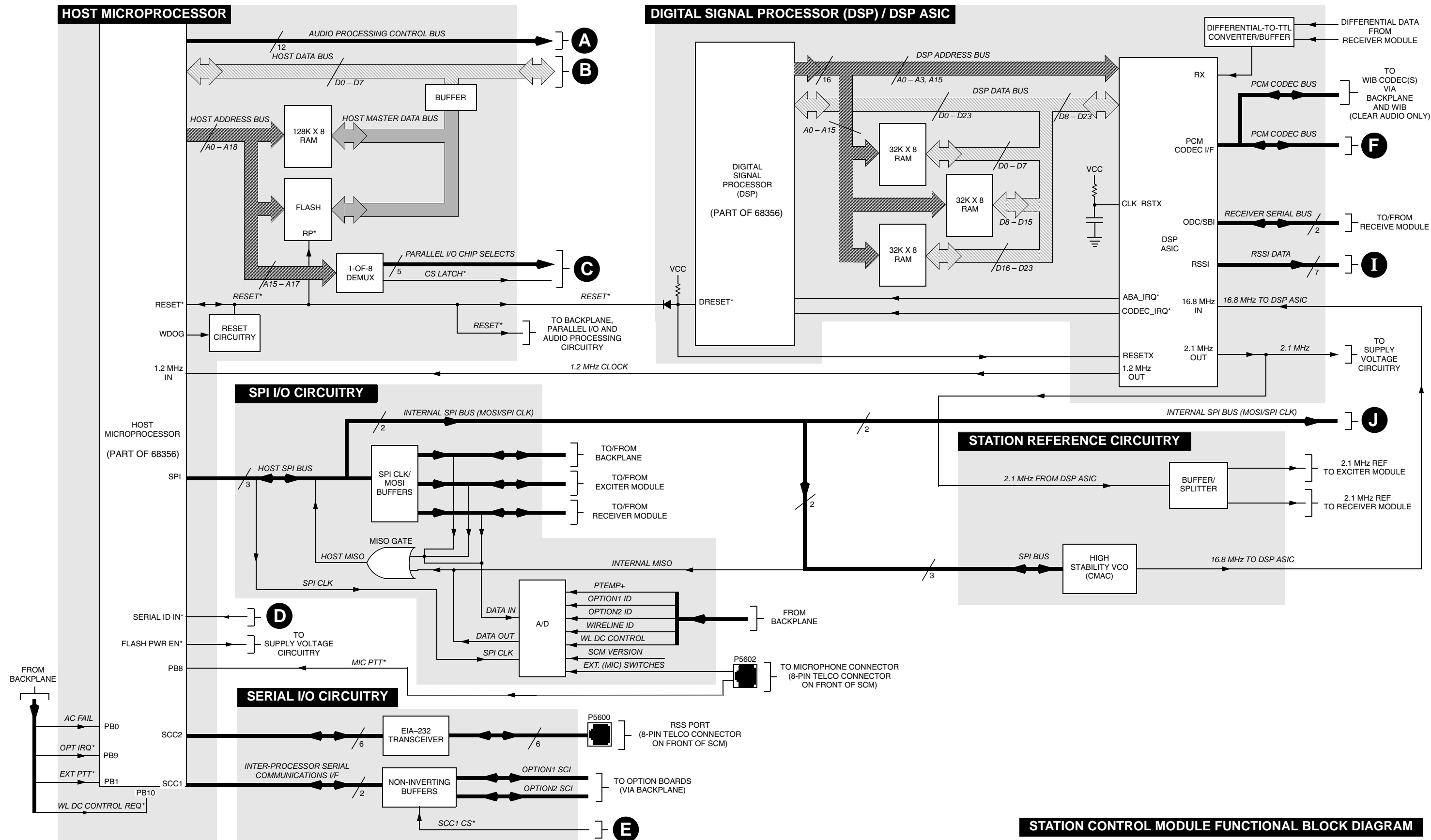
**STATION CONTROL MODULE FUNCTIONAL BLOCK DIAGRAM**

# **STATION CONTROL MODULE**

## **MODEL TCN6273N**

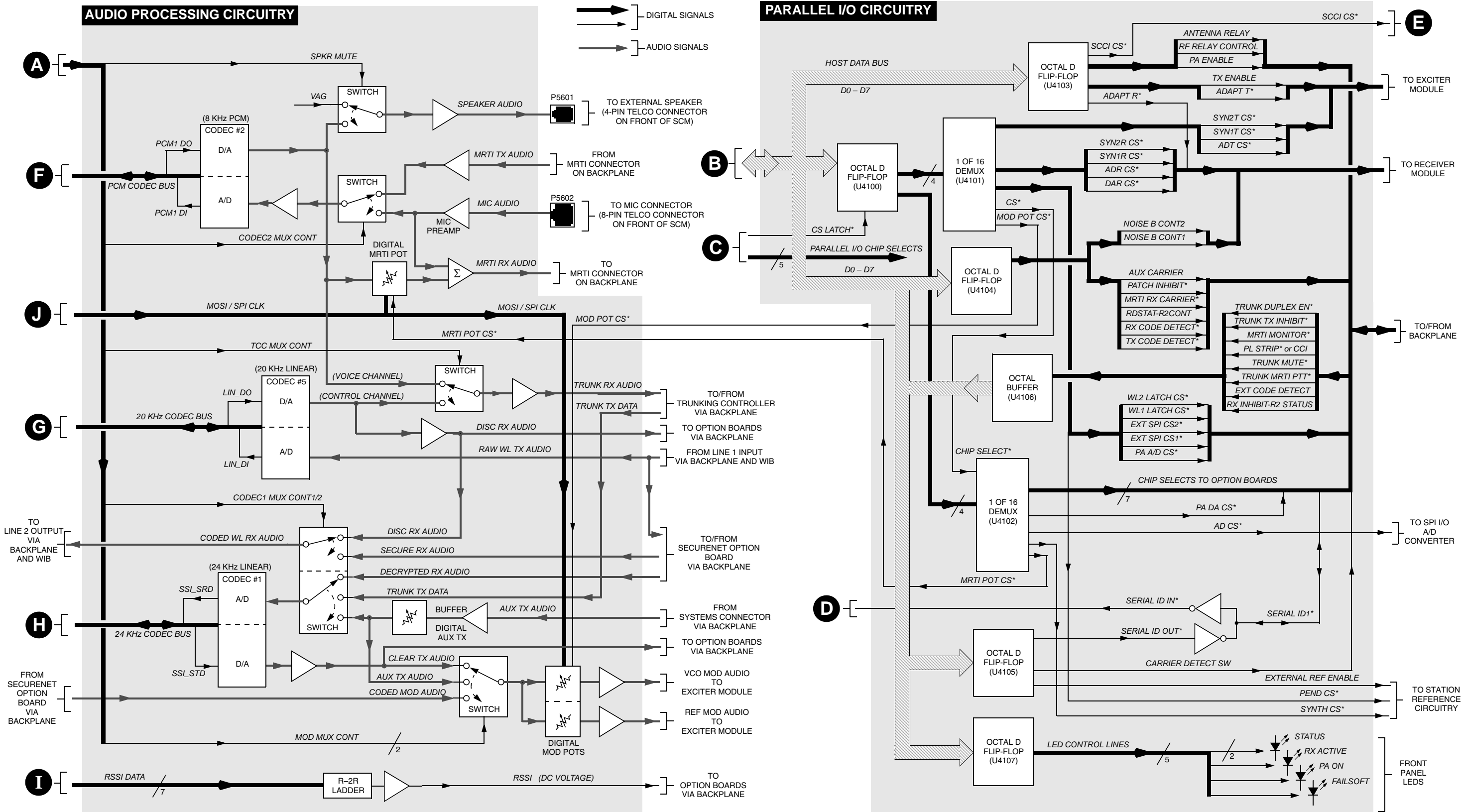
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STATION CONTROL MODULE  
MODEL TCN6273N



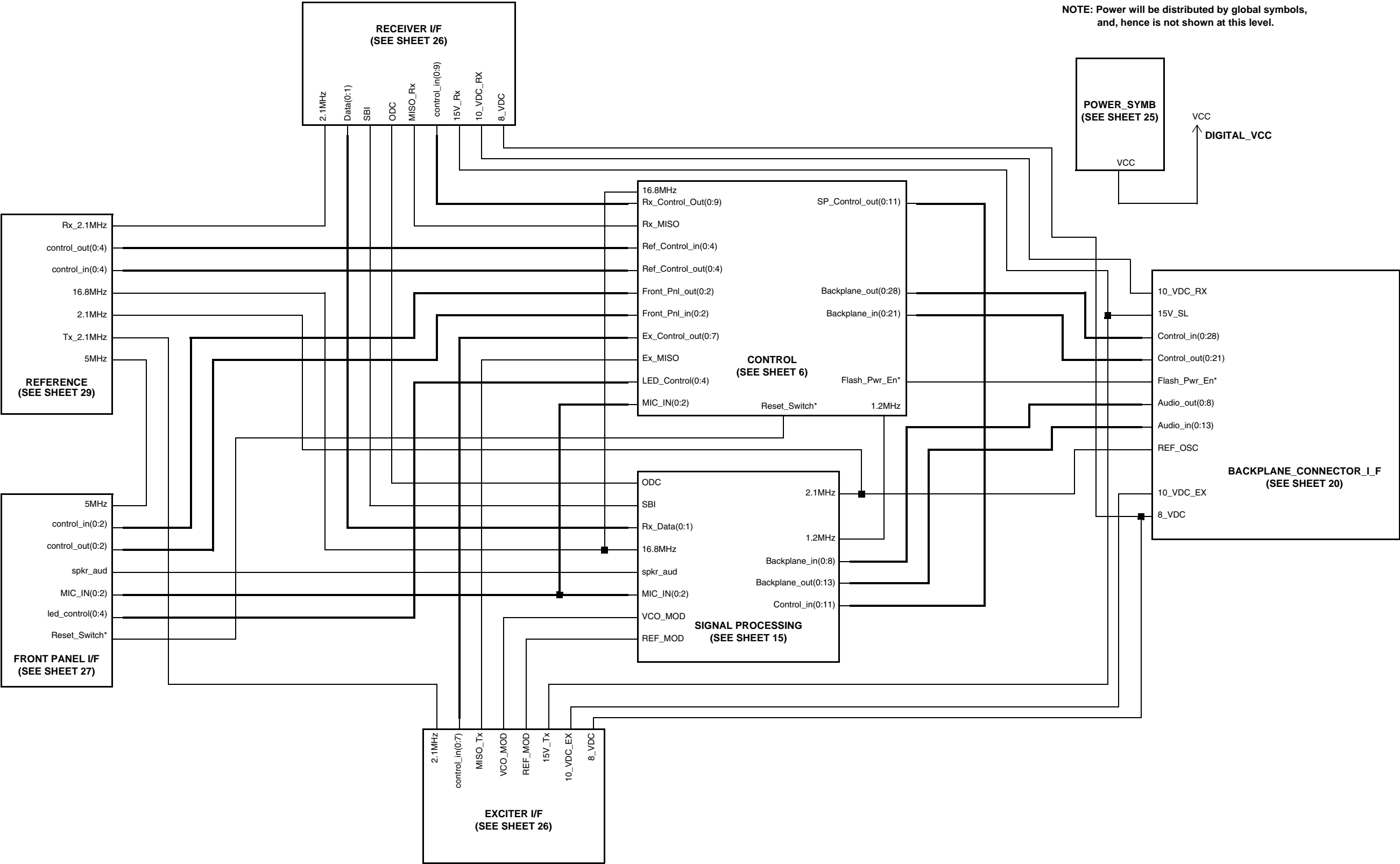
STATION CONTROL MODULE FUNCTIONAL BLOCK DIAGRAM

STATION CONTROL MODULE  
MODEL TCN6273N



STATION CONTROL MODULE FUNCTIONAL BLOCK DIAGRAM

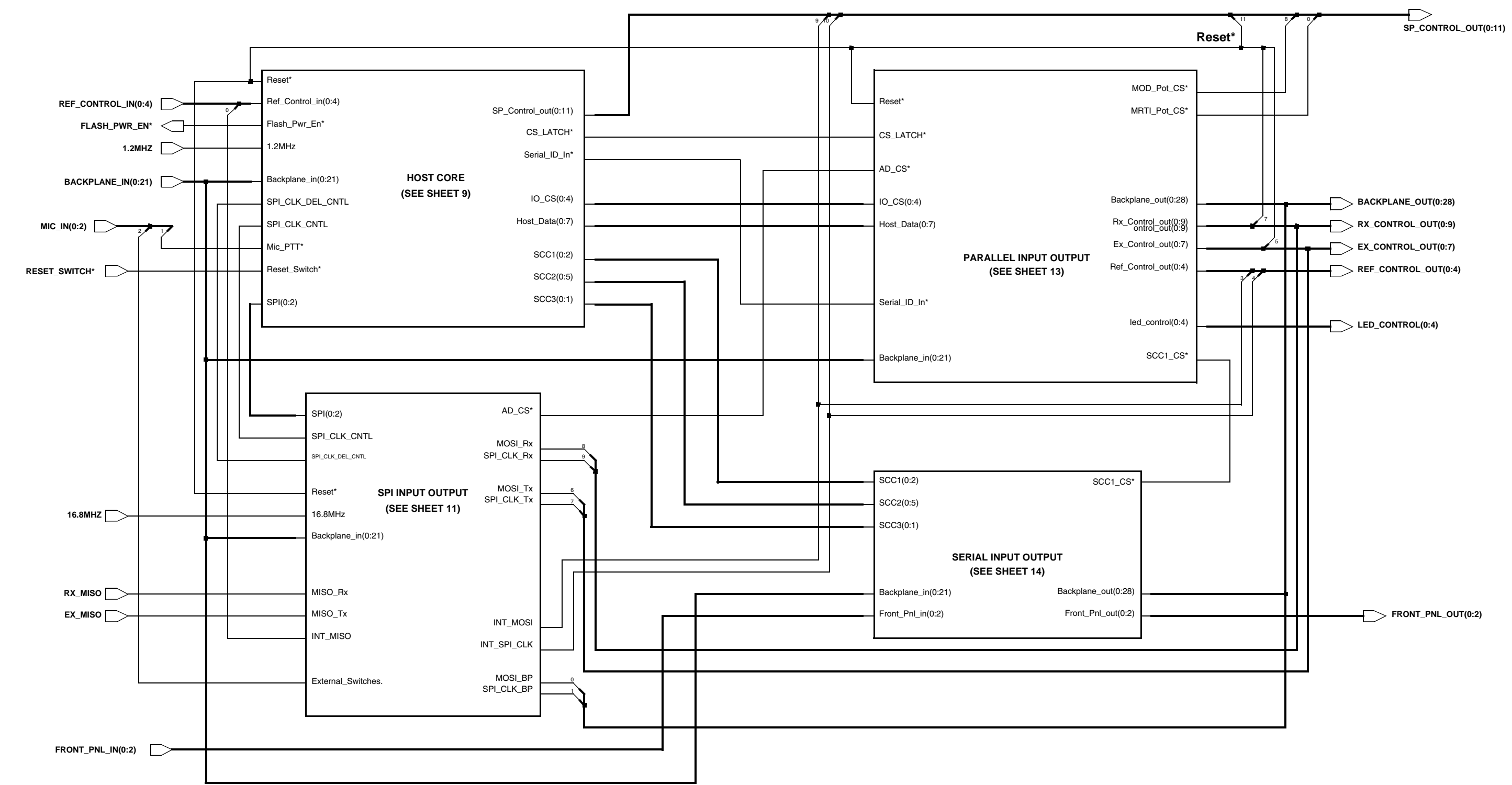
STATION CONTROL MODULE  
MODEL TCN6273N



SCM TOP LEVEL BLOCK DIAGRAM



STATION CONTROL MODULE  
MODEL TCN6273N



SCM CONTROL CIRCUITS BLOCK DIAGRAM

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STATION CONTROL MODULE  
MODEL TCN6273N

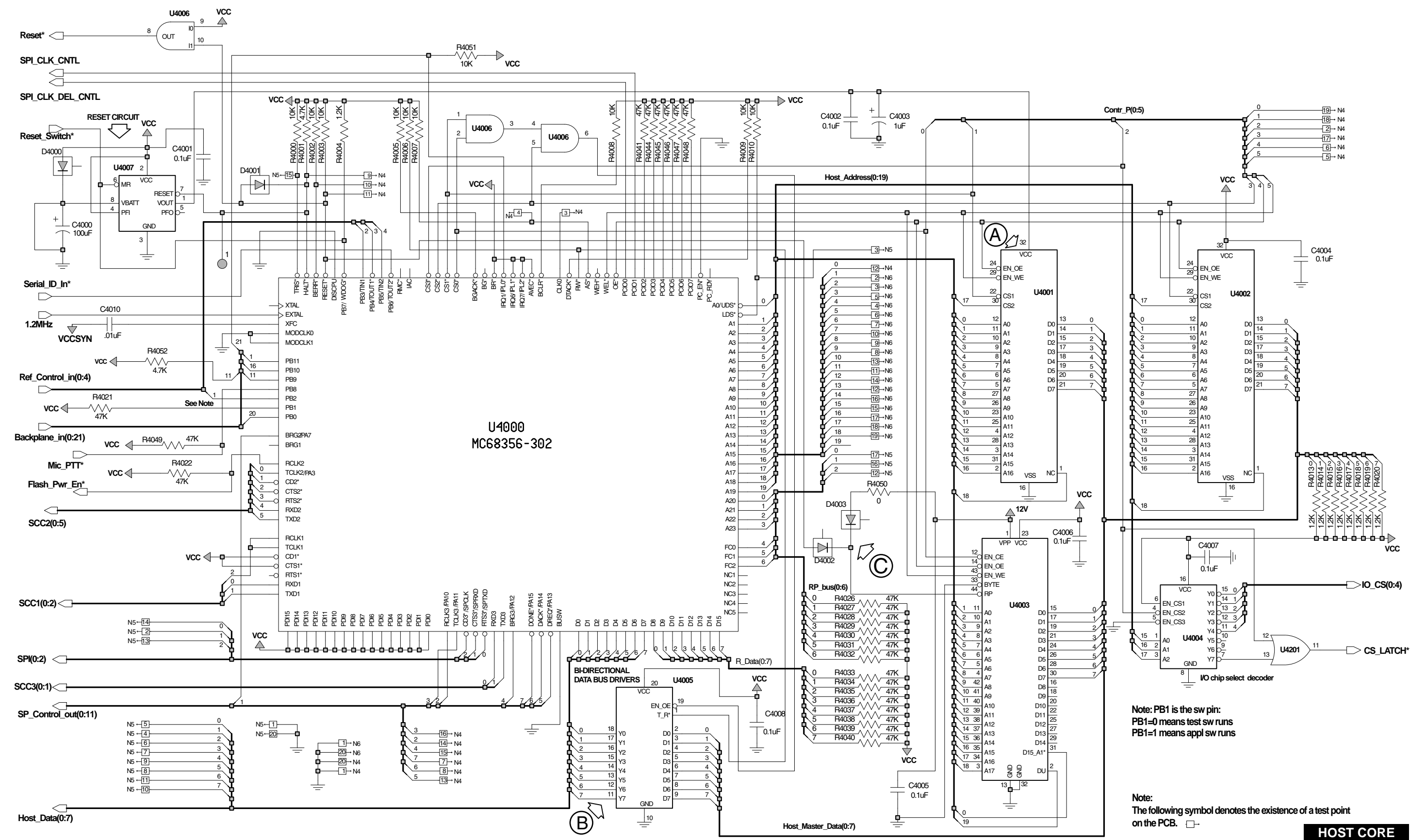
SERVICE NOTES-HOST CORE

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | VCC pin connected to the Battery Backup pin of U4007, to preserve the RAM content in case of power failure.  |
| Ⓑ           | Host Data Bus is split in 2 by the U4005 buffer: Host_Master_Data bus connects the memory devices and Host_Data bus connects the rest of the IC's (I/O's) on this data bus.  |
| Ⓒ           | While in Read mode, R4050 is not placed and the RP pin on the flash IC (U4003) is tied to the Reset pin on the processor via D4002, and the boot block is locked. When the Boot Block needs to be programmed (Write mode), R4050 is soldered in and the RP pin is tied to 12V via D4003 and R4050. |

SCHEMATIC IC'S TABLE-HOST CORE

| Reference | Type      | Description                                      |
|-----------|-----------|--|
| U4000     | MC68356   | Signal Processing Communication Engine           |
| U4001,2   | HM628128  | CMOS Static RAM, 128 * 8 byte                    |
| U4003     | AT49F8011 | 1 Meg *16 Boot Block Flash Memory                |
| U4004     | MC74AC138 | 1 of 8 Decoder/Demultiplexer                     |
| U4005     | MC74AC245 | Octal Bidirectional Transceiver With 3-State I/O |
| U4006...  | MC74AC08  | Quad 2 input AND Gate                            |
| U4007     | MAX703    | μP Supervisory Circuit with Battery Backup       |
| U4201...  | MC74AC32  | Quad 2-input OR gate                             |

STATION CONTROL MODULE  
MODEL TCN6273N



Note: PB1 is the sw pin:  
PB1=0 means test sw runs  
PB1=1 means appl sw runs

Note:  
The following symbol denotes the existence of a test point  
on the PCB. □

HOST CORE

STATION CONTROL MODULE  
MODEL TCN6273N

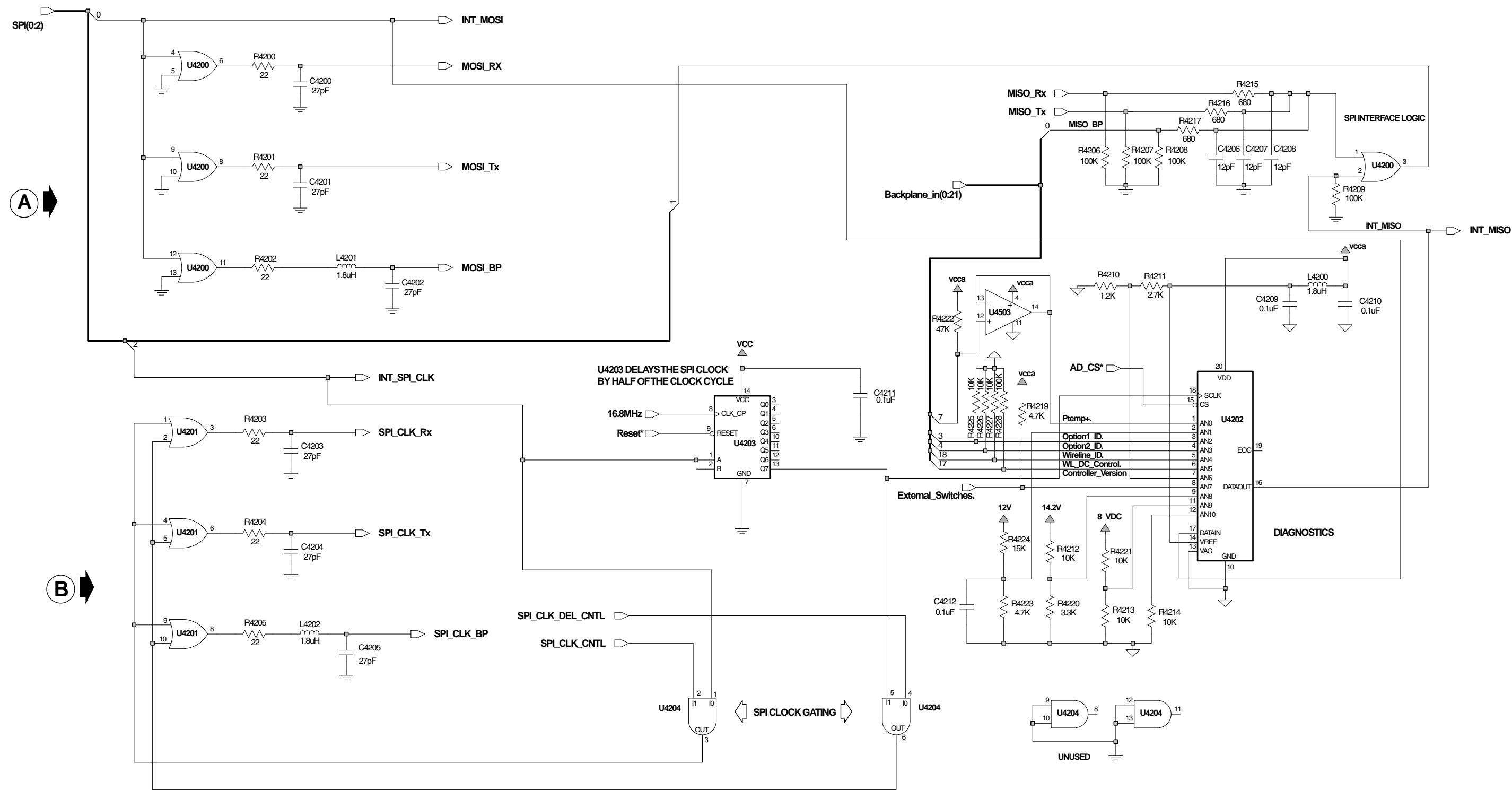
SERVICE NOTES-SPI I/O

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ Ⓑ         | SPI bus is buffered as it goes to the receiver, exciter and back plane to avoid interference and reduce capacitance loading. |

SCHEMATIC IC'S TABLE-SPI I/O

| Reference | Type      | Description                                       |
|-----------|-----------|---|
| U4201...  | MC74AC32  | Quad 2-input OR gate                              |
| U4203     | MC74HC164 | 8 Bit Serial Input/Parallel Output Shift Register |
| U4503...  | MC33074   | Quad, High Performance Single Supply Op Amp       |

STATION CONTROL MODULE  
MODEL TCN6273N



SPI INPUT OUTPUT

# STATION CONTROL MODULE

## MODEL TCN6273N

PARALLEL I/O’S TABLE

| Reference | Description             | Memory Address | Data Value |
|-----------|-------------------------|----------------|------------|
| U4101-16  | PA_AD_CS*               | CS3 +\$38000   | \$XE       |
| U4101-15  | Ext_SPI_CS1*            | CS3 +\$38000   | \$XD       |
| U4101-14  | Ext_SPI_CS2*            | CS3 +\$38000   | \$XC       |
| U4101-13  | WL_Latch1_CS*           | CS3 +\$38000   | \$XB       |
| U4101-11  | WL_Latch2_CS*           | CS3 +\$38000   | \$XA       |
| U4101-10  | Pend_CS*                | CS3 +\$38000   | \$X9       |
| U4101-9   | (spare)                 | CS3 +\$38000   | \$X8       |
| U4101-8   | Mod_Pot_CS              | CS3 +\$38000   | \$X7       |
| U4101-7   | DAR_CS*                 | CS3 +\$38000   | \$X6       |
| U4101-6   | ADR_CS*                 | CS3 +\$38000   | \$X5       |
| U4101-5   | SYN1R_CS*               | CS3 +\$38000   | \$X4       |
| U4101-4   | SYN2R_CS*               | CS3 +\$38000   | \$X3       |
| U4101-3   | ADT_CS*                 | CS3 +\$38000   | \$X2       |
| U4101-2   | SYN1T_CS*               | CS3 +\$38000   | \$X1       |
| U4101-1   | SYN2T_CS*               | CS3 +\$38000   | \$X0       |
|           |                         |                |            |
| U4102-17  | (spare)                 | CS3+\$38000    | \$FF       |
| U4102-16  | (spare)                 | CS3+\$38000    | \$EF       |
| U4102-15  | (spare)                 | CS3+\$38000    | \$DF       |
| U4102-14  | (spare)                 | CS3+\$38000    | \$CF       |
| U4102-13  | (spare)                 | CS3+\$38000    | \$BF       |
| U4102-11  | Synth_CS*               | CS3+\$38000    | \$AF       |
| U4102-10  | A/D_CS*                 | CS3+\$38000    | \$9F       |
| U4102-9   | SPKR_Pot_CS             | CS3+\$38000    | \$8F       |
| U4102-8   | PA_DA_CS*               | CS3+\$38000    | \$7F       |
| U4102-7   | OP1_CS1*                | CS3+\$38000    | \$6F       |
| U4102-6   | OP1_CS2*                | CS3+\$38000    | \$5F       |
| U4102-5   | OP1_CS3*                | CS3+\$38000    | \$4F       |
| U4102-4   | OP1_CS4*                | CS3+\$38000    | \$3F       |
| U4102-3   | OP2_CS1*                | CS3+\$38000    | \$2F       |
| U4102-2   | OP2_CS2*                | CS3+\$38000    | \$1F       |
| U4102-1   | OP2_CS3*                | CS3+\$38000    | \$0F       |
|           |                         |                |            |
| U4103-19  | ADAPT_R*                | CS3+\$00000    | \$80       |
| U4103-16  | ADAPT_T*                | CS3+\$00000    | \$40       |
| U4103-15  | TX_ENABLE               | CS3+\$00000    | \$20       |
| U4103-12  | SCC1_CS*                | CS3+\$00000    | \$10       |
| U4103-9   |                         | CS3+\$00000    | \$8        |
| U4103-6   | PA_ENABLE               | CS3+\$00000    | \$4        |
| U4103-5   | RF_Relay_Cntrl          | CS3+\$00000    | \$2        |
| U4103-2   | Ant_Relay               | CS3+\$00000    | \$1        |
|           |                         |                |            |
| U4104-19  | NOISE_B_CONT1           | CS3+\$08000    | \$80       |
| U4104-16  | NOISE_B_CONT2           | CS3+\$08000    | \$40       |
| U4104-15  | Tx_Code_Det             | CS3+\$08000    | \$20       |
| U4104-12  | Rx_Code_Det             | CS3+\$08000    | \$10       |
| U4104-9   | Rdstat                  | CS3+\$08000    | \$8        |
| U4104-6   | MRTI_Rx_Carrier*        | CS3+\$08000    | \$4        |
| U4104-5   | Patch_Inhibit_or_RSTAT* | CS3+\$08000    | \$2        |
| U4104-2   | Aux_carrier_or_TSTAT*   | CS3+\$08000    | \$1        |

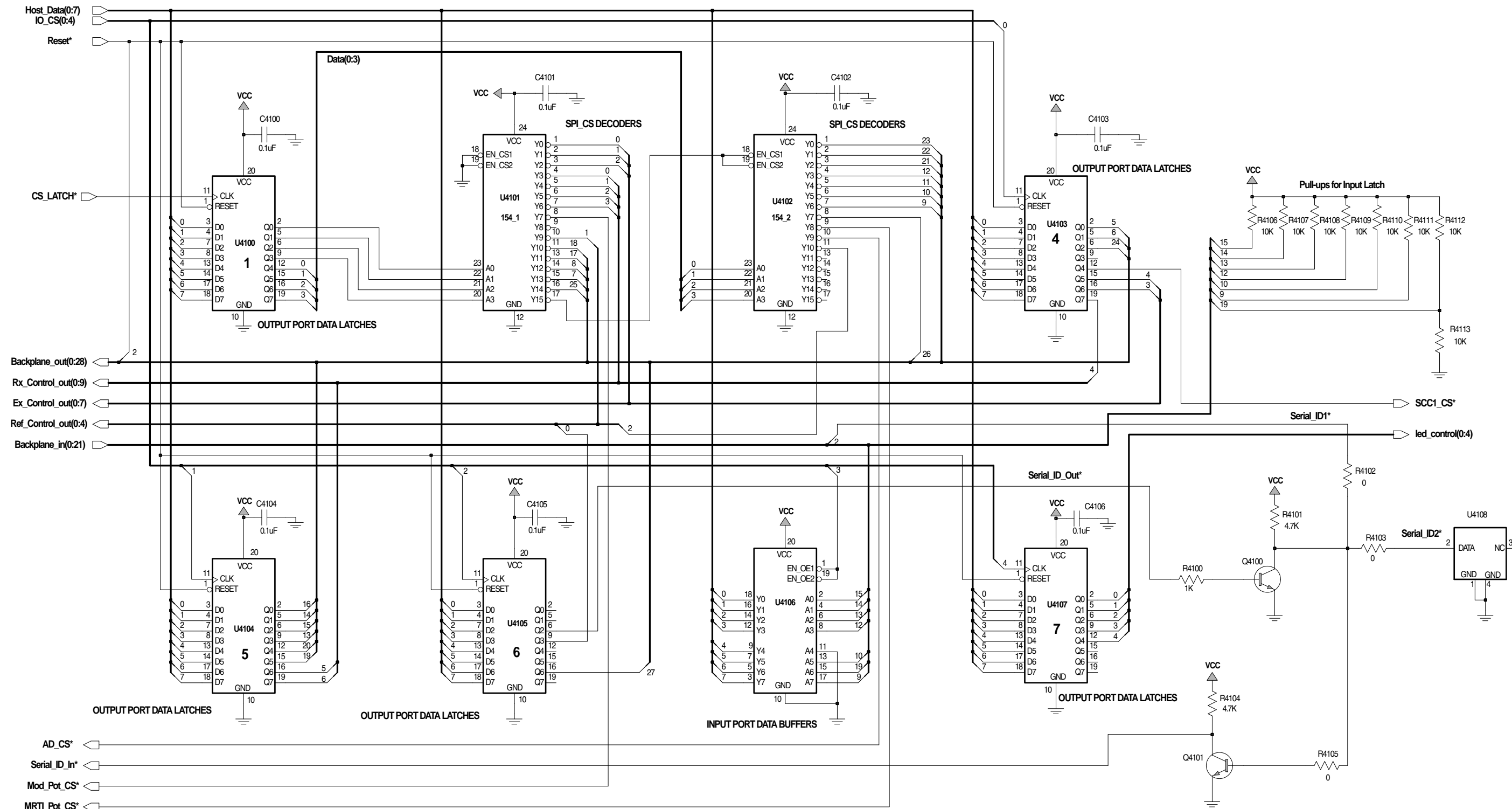
PARALLEL I/O’S TABLE (continued)

| Reference | Description                   | Memory Address | Data Value |
|-----------|-------------------------------|----------------|------------|
| U4105-19  | (spare)                       | CS3 +\$10000   | \$80       |
| U4105-16  | Carrier_Detect_Switch         | CS3 +\$10000   | \$40       |
| U4105-15  | (spare)                       | CS3 +\$10000   | \$20       |
| U4105-12  | (spare)                       | CS3 +\$10000   | \$10       |
| U4105-9   | Ext_Ref_En                    | CS3 +\$10000   | \$8        |
| U4105-6   | Serial_ID_Out*                | CS3 +\$10000   | \$4        |
| U4105-5   |                               | CS3 +\$10000   | \$2        |
| U4105-2   | (spare)                       | CS3 +\$10000   | \$1        |
|           |                               |                |            |
| U4107-2   | LED cntl (failsoft*)          | CS3 +\$20000   | \$1        |
| U4107-5   | LED cntl (rx_act*)            | CS3 +\$20000   | \$2        |
| U4107-6   | LED cntl (pa_on*)             | CS3 +\$20000   | \$4        |
| U4107-9   | LED cntl (stn_stat_bicolor1*) | CS3 +\$20000   | \$8        |
| U4107-12  | LED cntl (stn_stat_bicolor2*) | CS3 +\$20000   | \$10       |
| U4107-15  | (spare)                       | CS3 +\$20000   | \$20       |
| U4107-16  | (spare)                       | CS3 +\$20000   | \$40       |
| U4107-19  | (spare)                       | CS3 +\$20000   | \$80       |
|           |                               |                |            |
| U4000-V12 | Mod_Mux_Cont1                 |                |            |
| U4000-W13 | Mod_Mux_Cont2                 |                |            |
| U4000-U12 | Codec1_Mux_Cont1              |                |            |
| U4000-U17 | Codec1_Mux_Cont2              |                |            |
| U4000-T17 | TCC_Mux_Cont                  |                |            |
| U4000-U18 | Codec2_Mux_Cont               |                |            |
| U4000-U16 | Spkr_Mute                     |                |            |
| U4000-U15 | Flash_Pwr_En*                 |                |            |
|           |                               |                |            |
| U4106-17  | R2_Status                     | CS3 +\$18000   |            |
| U4106-15  | Ext_Code_Det                  | CS3 +\$18000   |            |
| U4106-13  | Trkg/MRTI_PTT*                | CS3 +\$18000   |            |
| U4106-11  | not used                      | CS3 +\$18000   |            |
| U4106-8   | PL_Strip_or_CCI*              | CS3 +\$18000   |            |
| U4106-6   | MRTI_Monitor*                 | CS3 +\$18000   |            |
| U4106-4   | Trunk_Tx_Inhibit*             | CS3 +\$18000   |            |
| U4106-2   | Trunk_Duplex_Enable*          | CS3 +\$18000   |            |
|           |                               |                |            |
| U4000-M17 | Opt_IRQ*                      |                |            |
| U4000_P4  | SPI_CLK_CNTL                  |                |            |
| U4000_R1  | SPI_CLK_DEL_CNTL              |                |            |
|           |                               |                |            |
| U4000-P19 | Ext_PTT*                      |                |            |
| U4000-N16 | WL_DC_Control_REQ*            |                |            |
| U4000-P18 | TRUNK_MUTE*                   |                |            |
| U4000-R19 | Mic_PTT*                      |                |            |
| U4000-R17 | Serial_ID_In*                 |                |            |
| U4000-P17 | Lock                          |                |            |
| U4000-T18 | 5MHz_Act                      |                |            |
| U4000-N18 | 16.8MHz_Act                   |                |            |
| U4000-P16 | Pend_Freq_Low                 |                |            |
| U4000-M16 | Software indicator            |                |            |
| U4000-N19 | AC_FAIL                       |                |            |

SCHEMATIC IC’S TABLE-PARALLEL I/O

| Reference | Type      | Description   |
|-----------|-----------|---|
| U4100...  | MC74HC273 | Octal D Flip-Flop with Common Clock and Reset               |
| U4101...  | MC74HC154 | 1 of 16 Decoder/Demultiplexer                               |
| U4106...  | MC74HC244 | Octal 3 State Noninverting Buffer/Line Driver/Line Receiver |
| U4108     | DS2400    | Silicon Serial Number                                       |

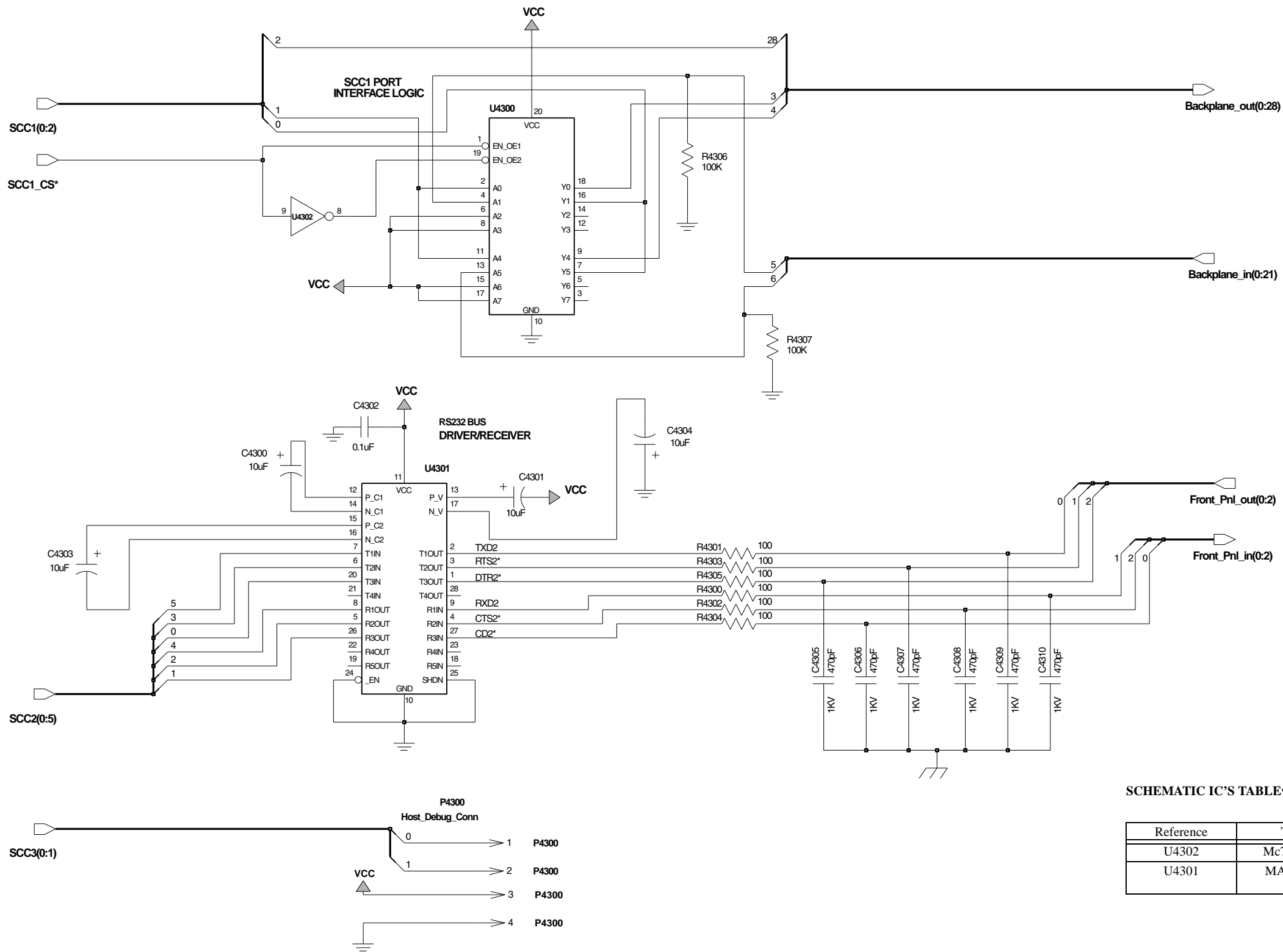
STATION CONTROL MODULE  
MODEL TCN6273N



PARALLEL INPUT OUTPUT



STATION CONTROL MODULE  
MODEL TCN6273N

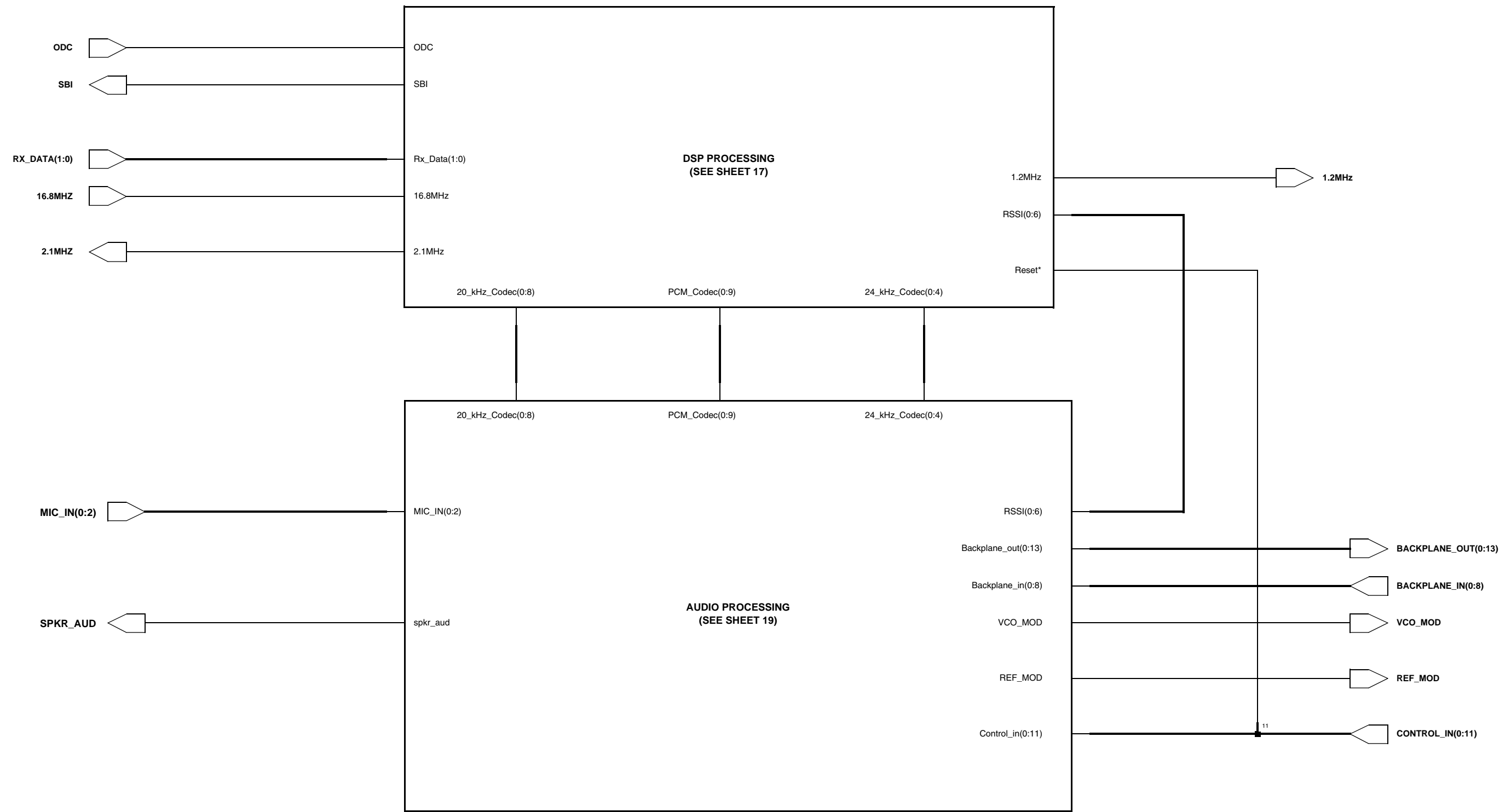


SCHEMATIC IC'S TABLE-SERIAL I/O

| Reference | Type     | Description                         |
|-----------|----------|-------------------------------------|
| U4302     | Mc74AC04 | Hex Inverter                        |
| U4301     | MAX211E  | EIA-232/V28 5V only Driver Receiver |

SERIAL INPUT OUTPUT

STATION CONTROL MODULE  
MODEL TCN6273N



SIGNAL PROCESSING CIRCUITS BLOCK DIAGRAM

STATION CONTROL MODULE

MODEL TCN6273N

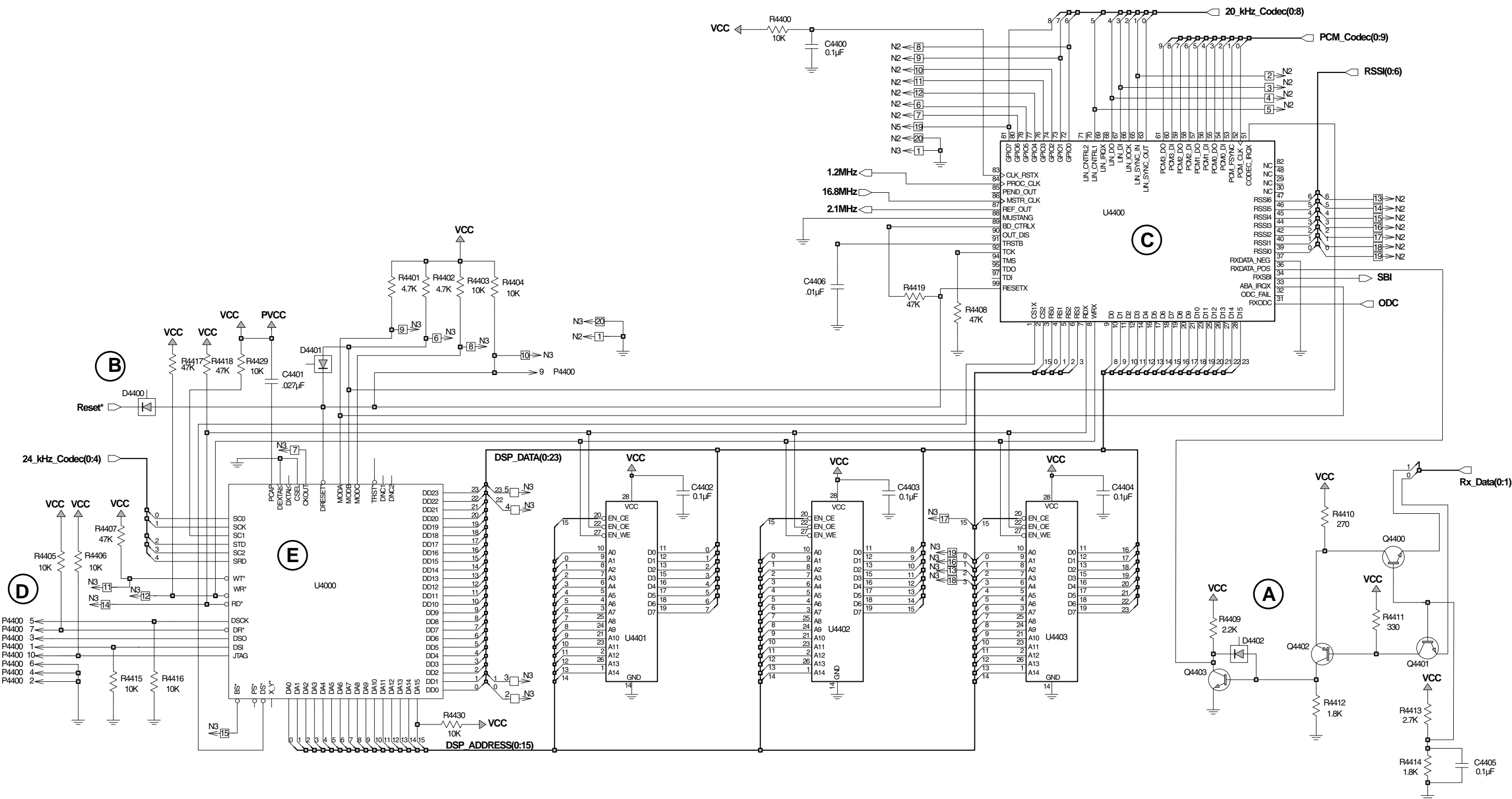
SERVICE NOTES-DSP PROCESSING

| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| Ⓐ           | Abacus Current-to-Voltage and Differential to Single-ended converter. Q4400 and Q4401 take the current output from the Abacus chip on the receiver board and converts it to a voltage. Then the two halves of the differential input are converted to a single output by Q4402. Finally, Q4403 outputs a full scale 0-5V bit stream representing the Abacus output. |
| Ⓑ           | Reset. Generated in the host core. Used here to reset the 56002 and U4400 (glue ASIC) and to configure the IRQ lines properly for system reset  |
| Ⓒ           | OGA. Outlaw Glue ASIC. Provides an interface to 4 PCM codecs and 1 linear codec. Receives the Abacus data stream. Provides RSSI output. Divides 16.8 MHz clock to provide both 1.2 MHz and 2.1 MHz clocks.  |
| Ⓓ           | P4400. OnCE port for DSP emulation.   |
| Ⓔ           | U4400. 56002 half or the 68356 device. Does all DSP. Has dedicated memory (U4401-U4403).  |

SCHEMATIC IC'S TABLE-DSP PROCESSING

| Reference | Type      | Description |
|-----------|-----------|-------------|
| U4400     | Custom IC | Asic        |
| U4401...  | MT5C2568  | 32k*8 SRAM  |

STATION CONTROL MODULE  
MODEL TCN6273N



DSP PROCESSING

STATION CONTROL MODULE  
MODEL TCN6273N

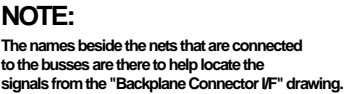
SERVICE NOTES -AUDIO PROCESSING

| Signal Path | Description/Nominal Signal Levels   |
|-------------|---|
| Ⓐ           | VCO MOD. Transmit audio out to exciter.   |
| Ⓑ           | REF MOD. Transmit audio to modulate synthesizer reference signal. Same audio as VCO MOD but at a different level.   |
| Ⓒ           | RSSI. R-2R ladder, D/A converter. Converts 7-bit RSSI output of Outlaw Glue ASIC to a 0-5V voltage.   |
| Ⓓ           | Limiter. Limits the input to CODEC #2.  |
| Ⓔ           | There is no Re audio path that can be monitored unless the Discriminator Rx Audio output is enabled. Rx audio comes in digitally from the Abacus chip and immediately enters the DSP processor (U4400/56002). |
| Ⓕ           | EEPOT. Potentiometer adjusted over the SPI bus by the host processor.   |

SCHEMATIC IC'S TABLE-AUDIO PROCESSING

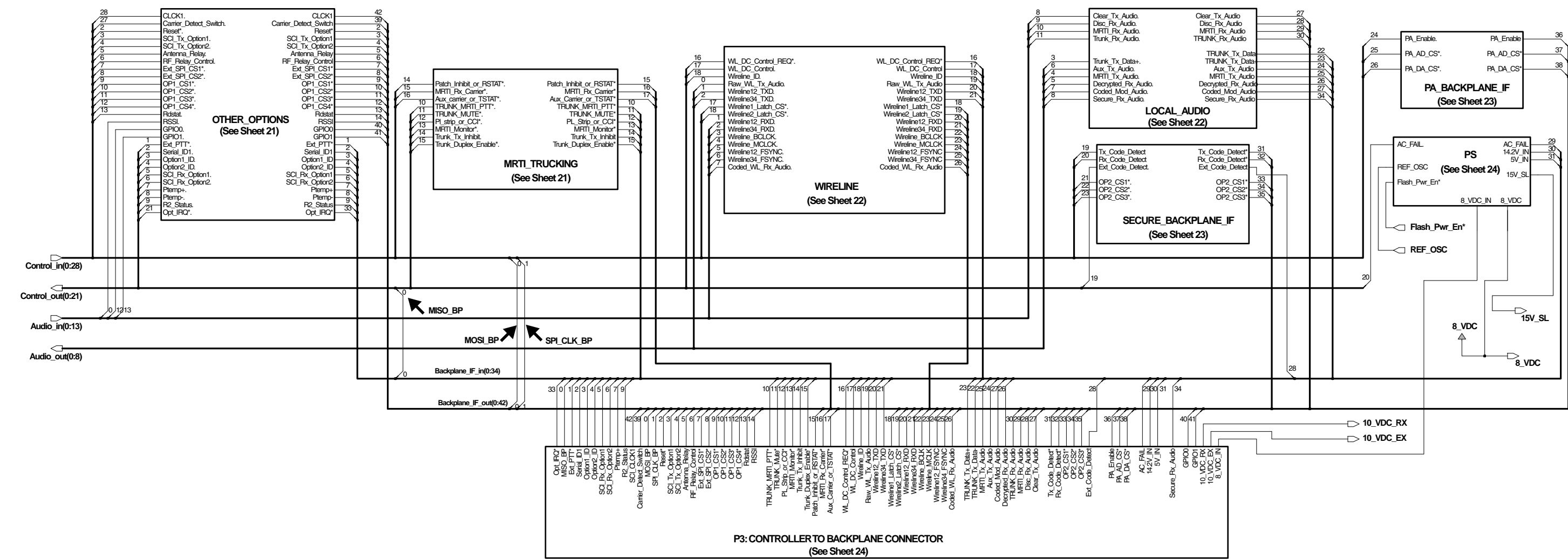
| Reference | Type       | Description                                       |
|-----------|------------|---|
| U4501     | MC74AC74   | Dual D-type Positive-Edge triggered Flip-Flop     |
| U4502...  | CSP1027    | Linear Codec                                      |
| U4503...  | MC33074    | Quad, High Performance Single Supply Op Amp       |
| U4504...  | MC145480   | PCM Codec   |
| U4506...  | MC33074    | Quad Opamp, Single Supply                         |
| U4507     | MC74HC4052 | Dual 4-Channel Analog Multiplexer/Demultiplexer   |
| U4508...  | DS1267-10  | Dual Digital Potentiometer                        |
| U4509     | MC33204    | Rail to Rail Op amps                              |
| U4511...  | MC74HC4053 | Triple 2-Channel Analog Multiplexer/Demultiplexer |
| U4519...  | MC33202    | Dual Rail to Rail Op Amp                          |

**MODEL TCN6273N**



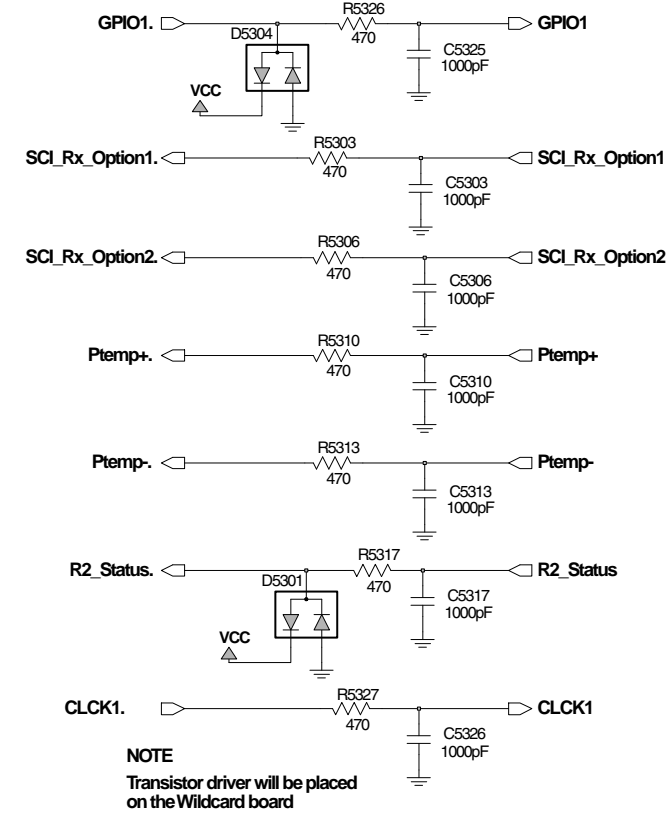
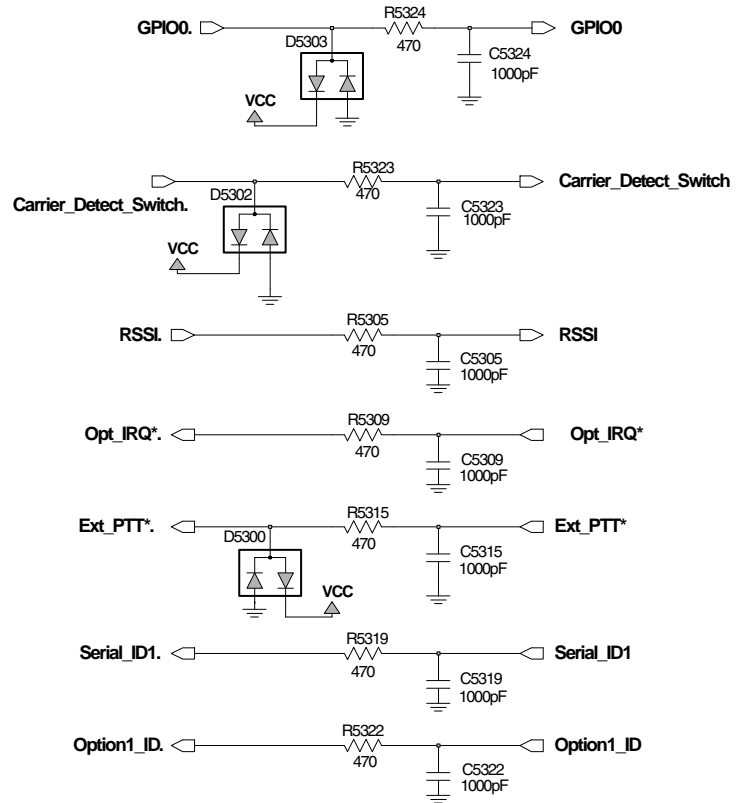
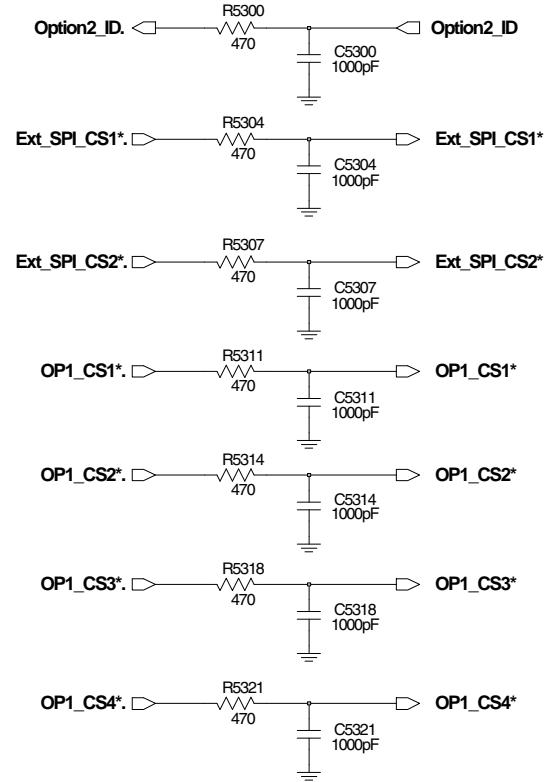
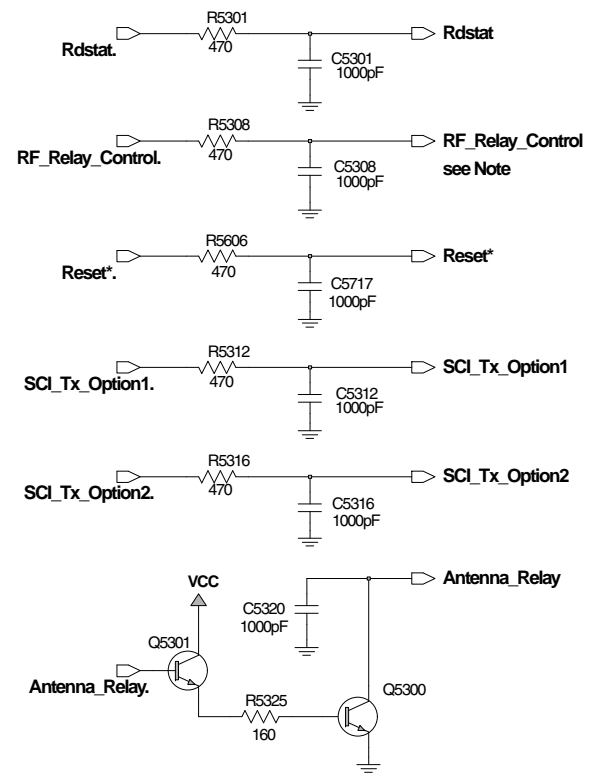
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STATION CONTROL MODULE  
MODEL TCN6273N



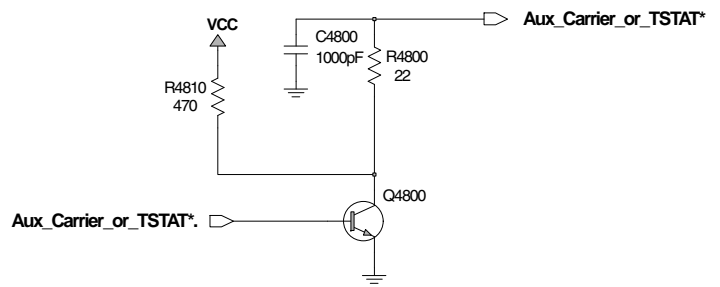
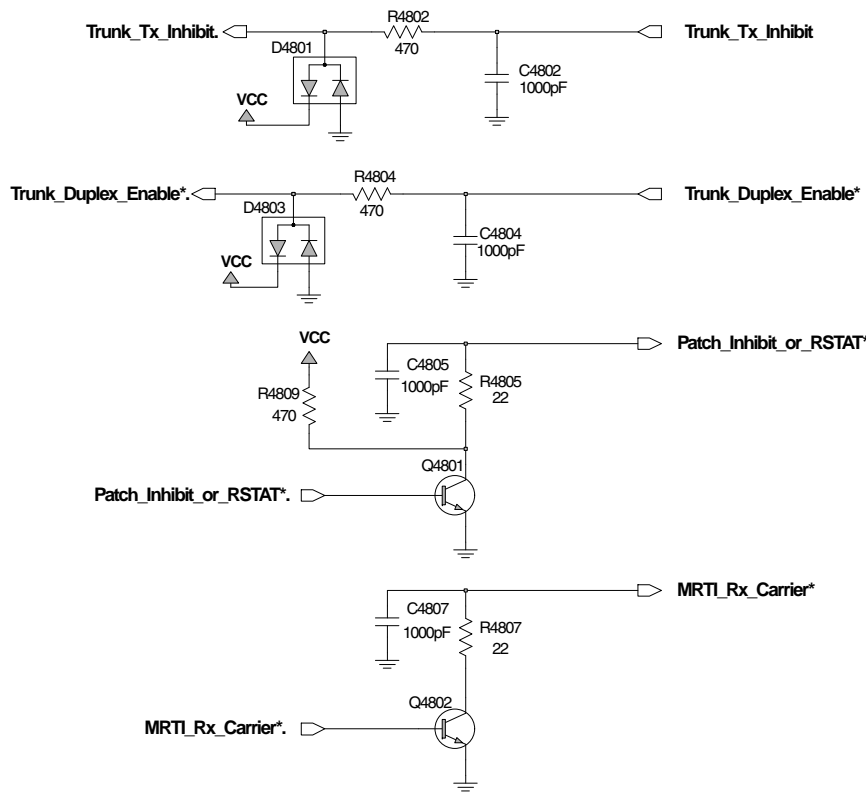
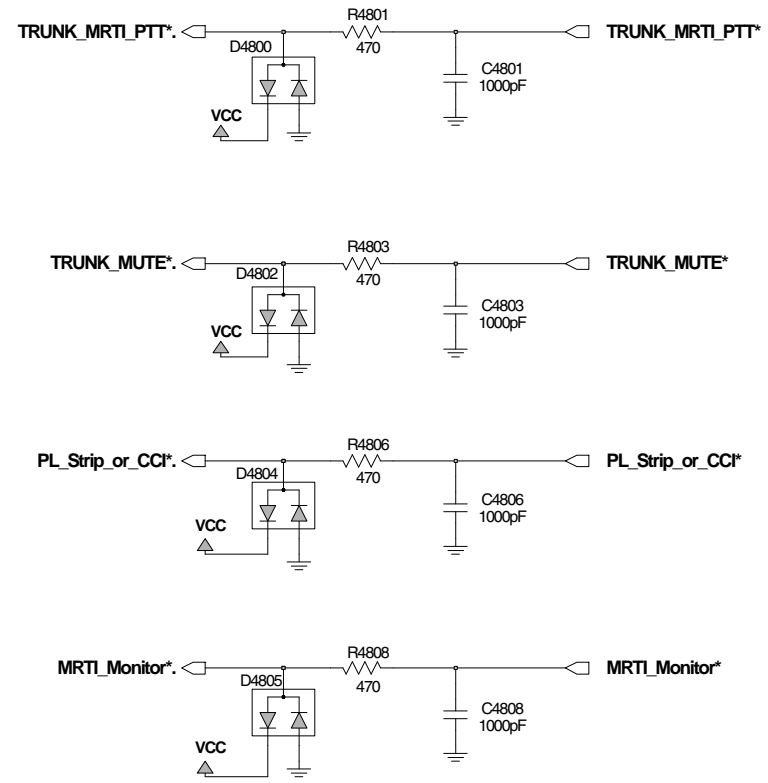
CONTROLLER TO BACKPLANE INTERFACE BLOCK DIAGRAM

STATION CONTROL MODULE  
MODEL TCN6273N



NOTE  
Transistor driver will be placed  
on the Wildcard board

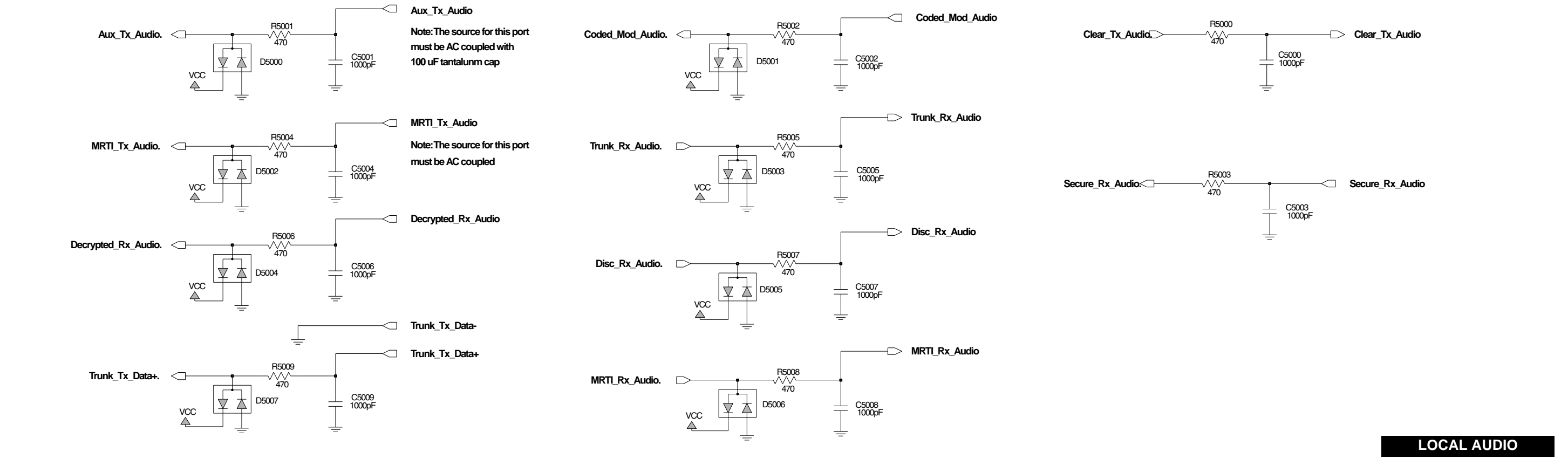
OTHER OPTIONS



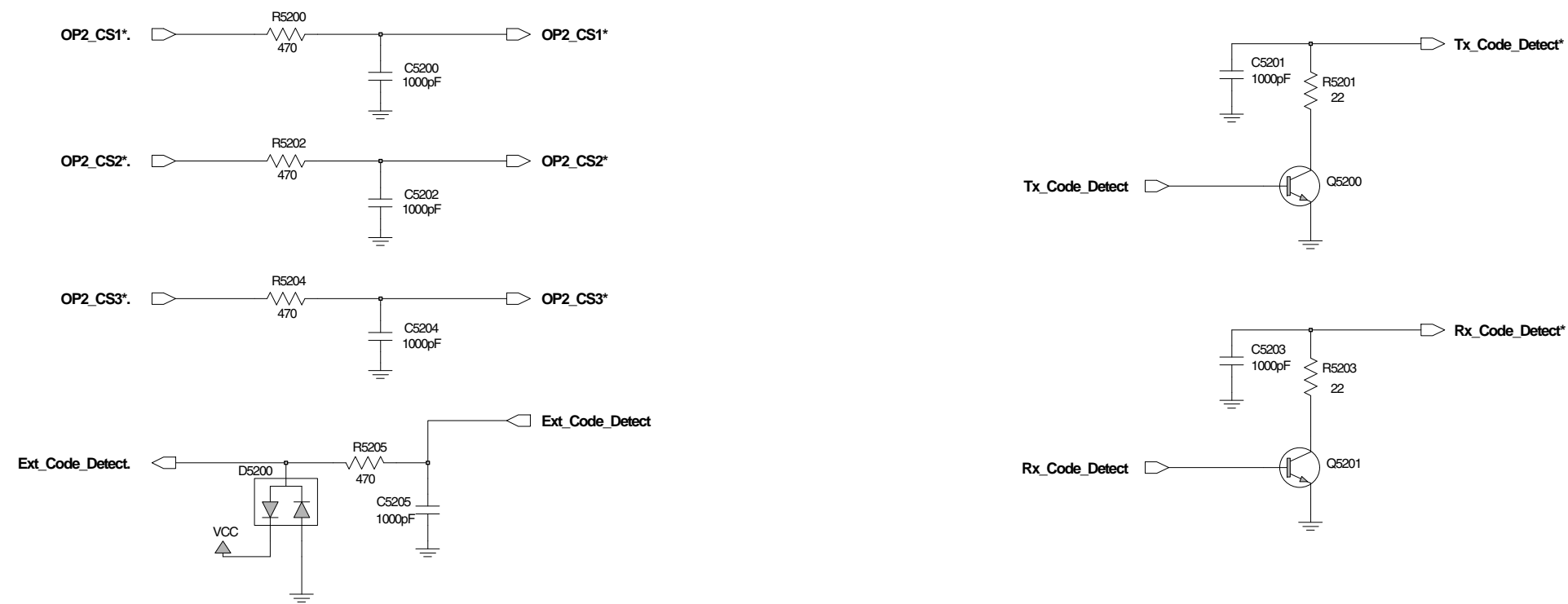
MRTI TRUNKING



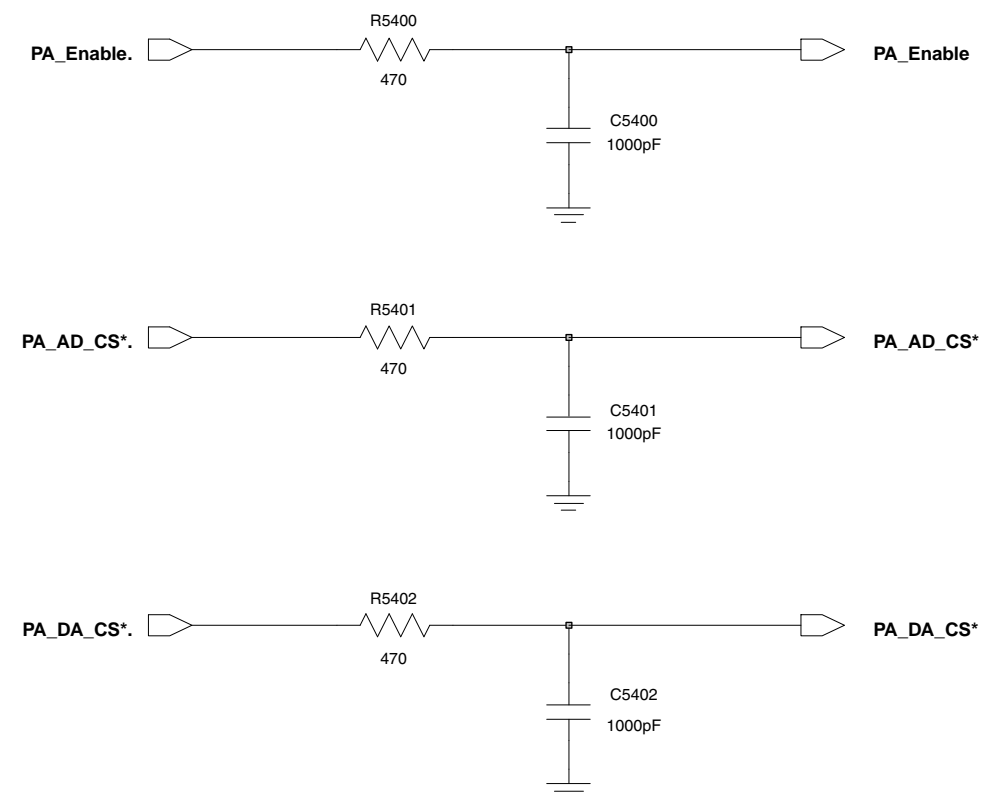
STATION CONTROL MODULE  
MODEL TCN6273N



STATION CONTROL MODULE  
MODEL TCN6273N



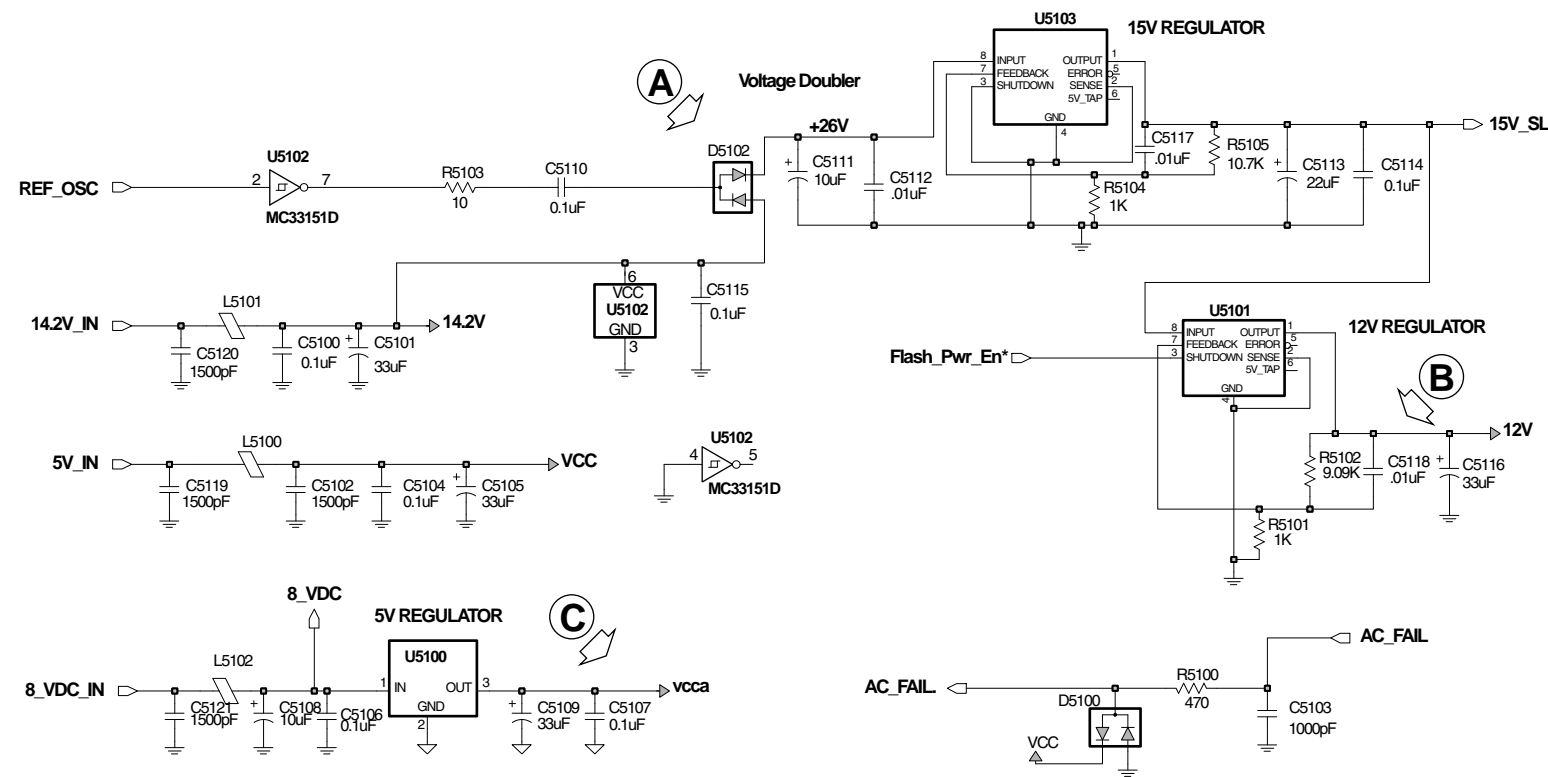
SECURENET INTERFACE



PA INTERFACE

# STATION CONTROL MODULE

## MODEL TCN6273N

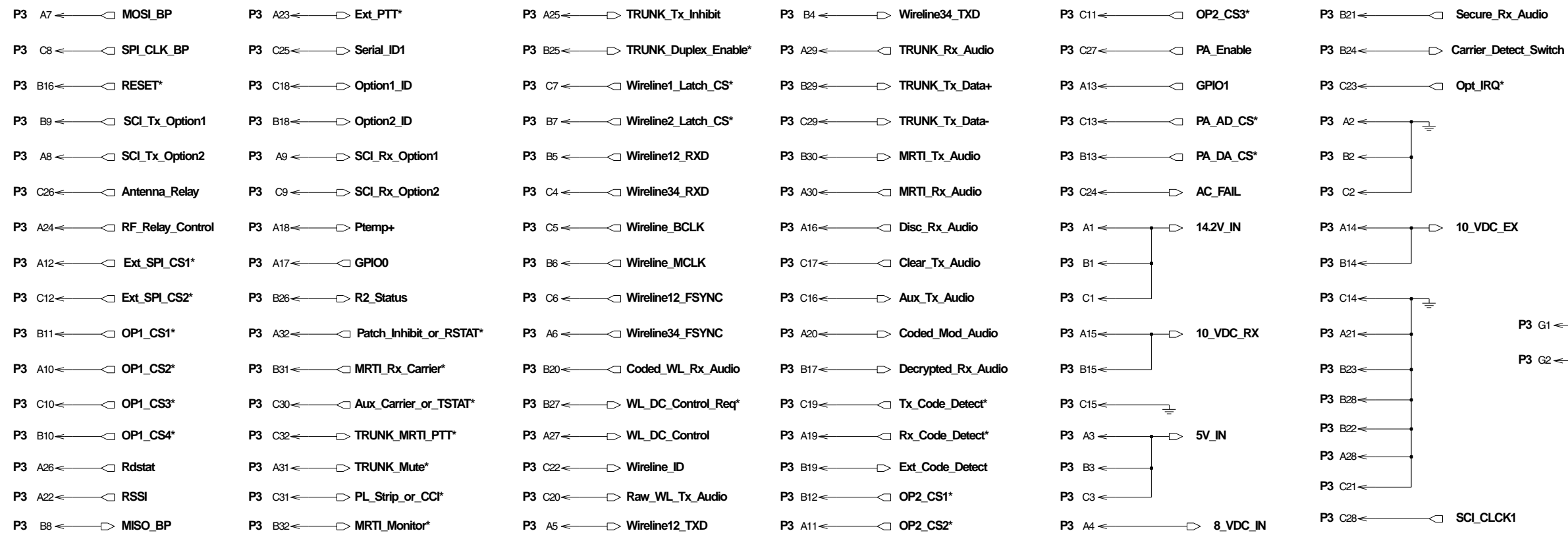


| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | Voltage Doubler Circuit. Nearly doubles the 14.2V supply. This output is then regulated to provide the 15V steering line voltage for the receiver and exciter. Necessary for possible low input on the 14.2V line. |
| Ⓑ           | Flash Programming voltage regulator. A regulator that, when enabled by the software, provides 12V to allow programming of the Flash device.  |
| Ⓒ           | Analog 5V regulator. Provides the 5V supply, vcca, for the analog portion of the Station Control Board (see Audio sheet).  |

### SCHEMATIC IC'S TABLE-REGULATORS

| Reference | Type    | Description                        |
|-----------|---------|------------------------------------|
| U5100     | MC7805  | Power Supply Regulator, 5V         |
| U5102     | MC33151 | High Speed Dual Mosfet Driver      |
| U5103     | LP2951  | Power Supply Regulator, adjustable |

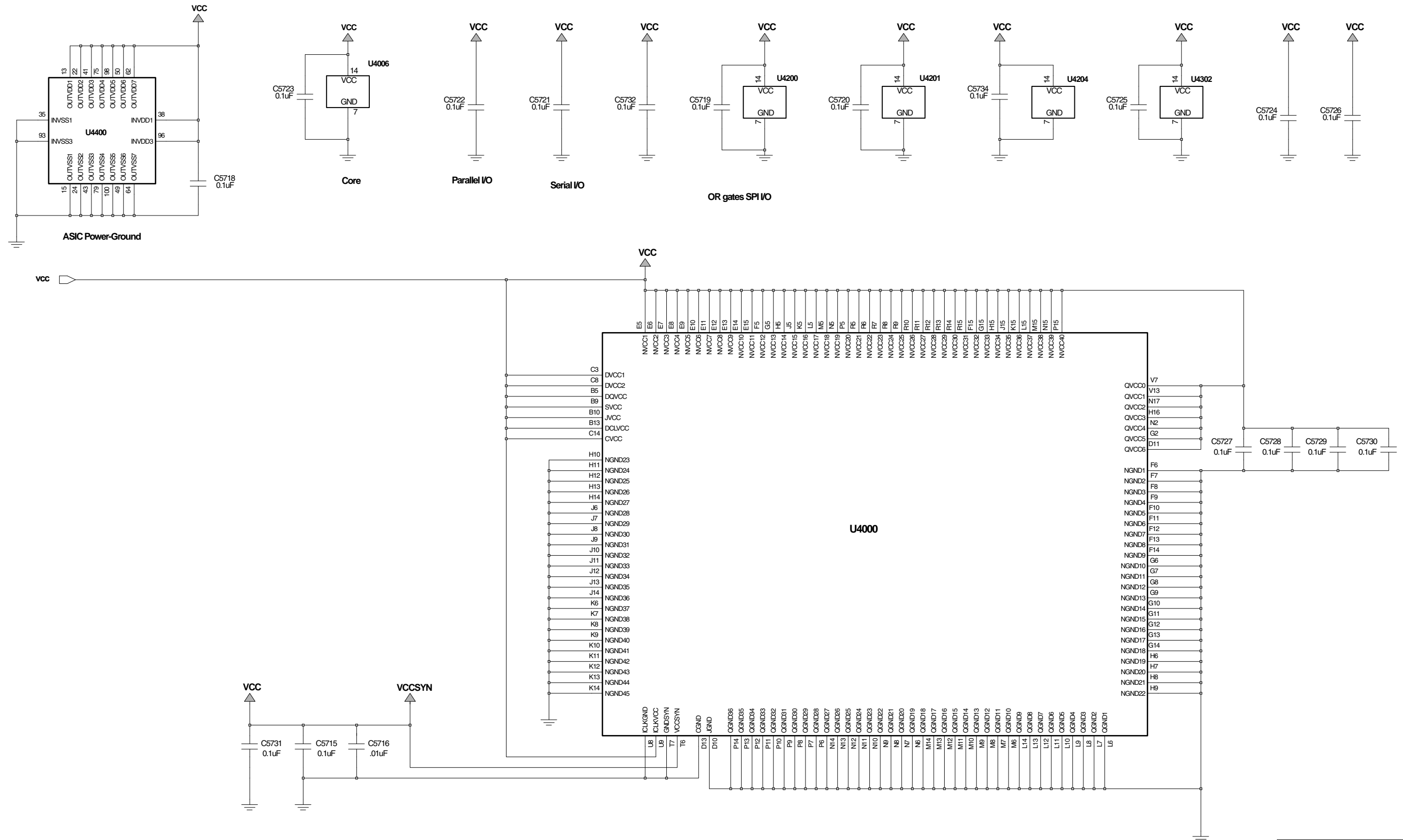
## POWER DISTRIBUTION



## CONTROLLER TO BACKPLANE CONNECTOR

# STATION CONTROL MODULE

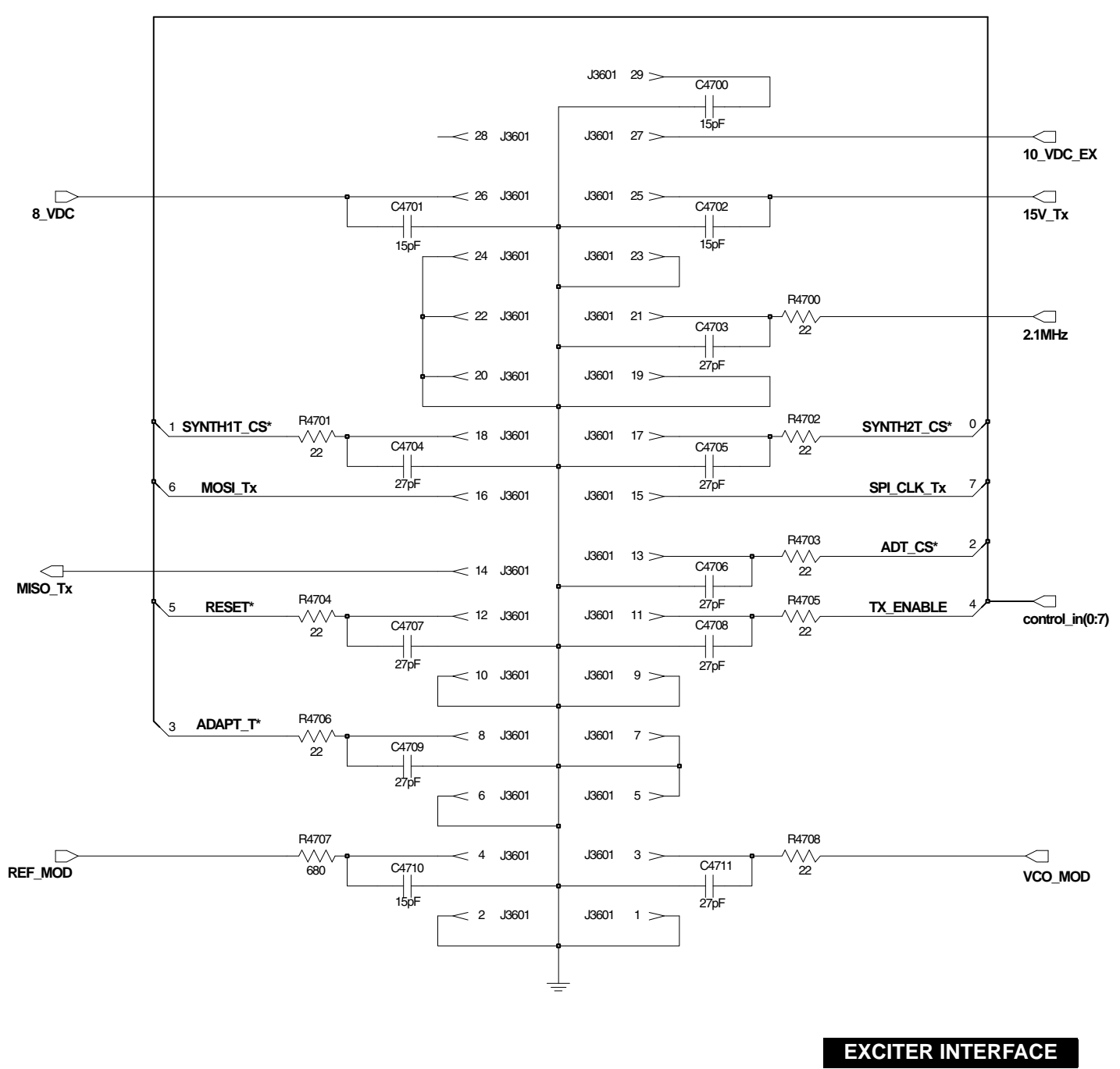
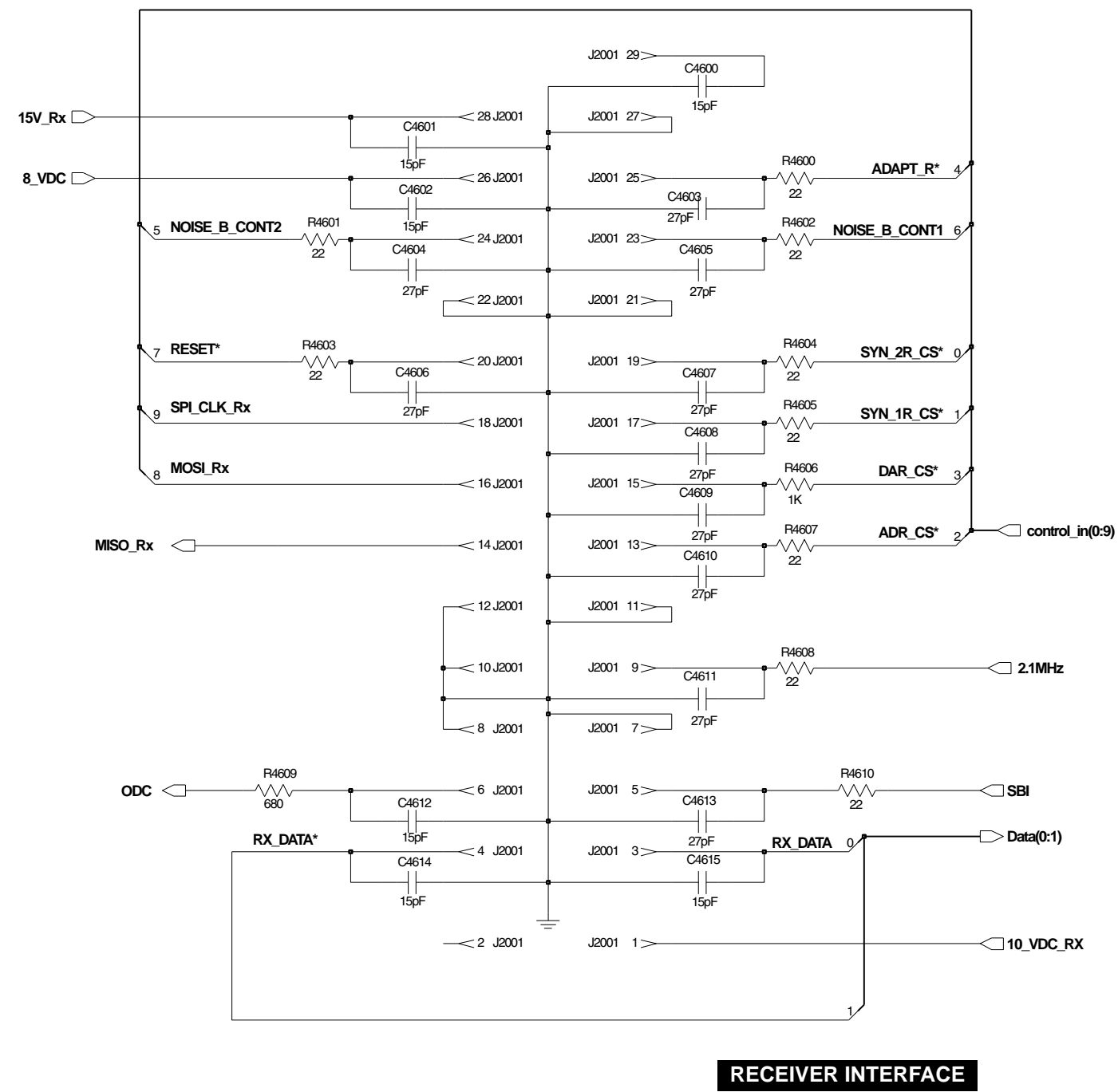
## MODEL TCN6273N



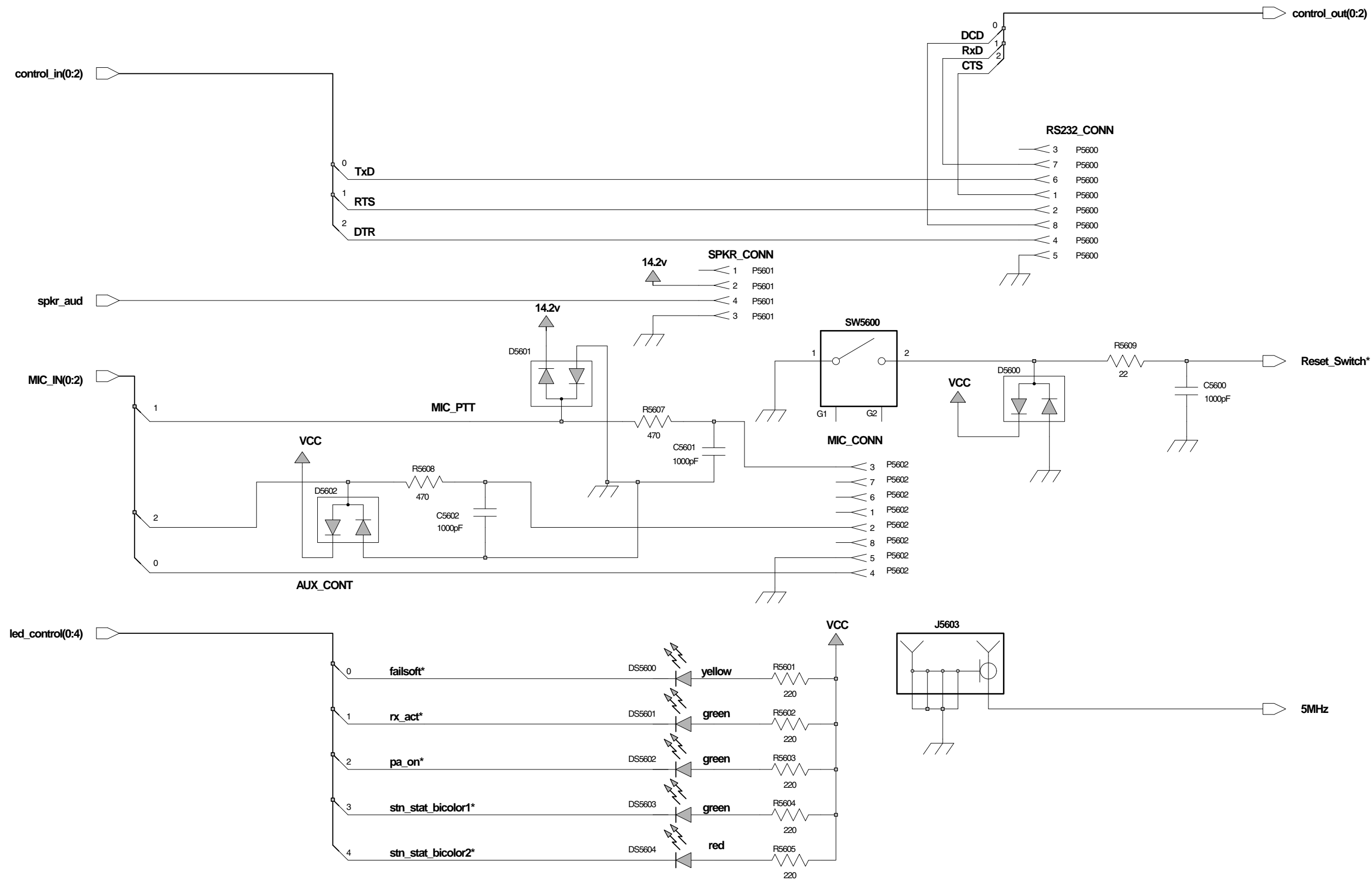
## POWER SYMBOLS

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FRONT PANEL

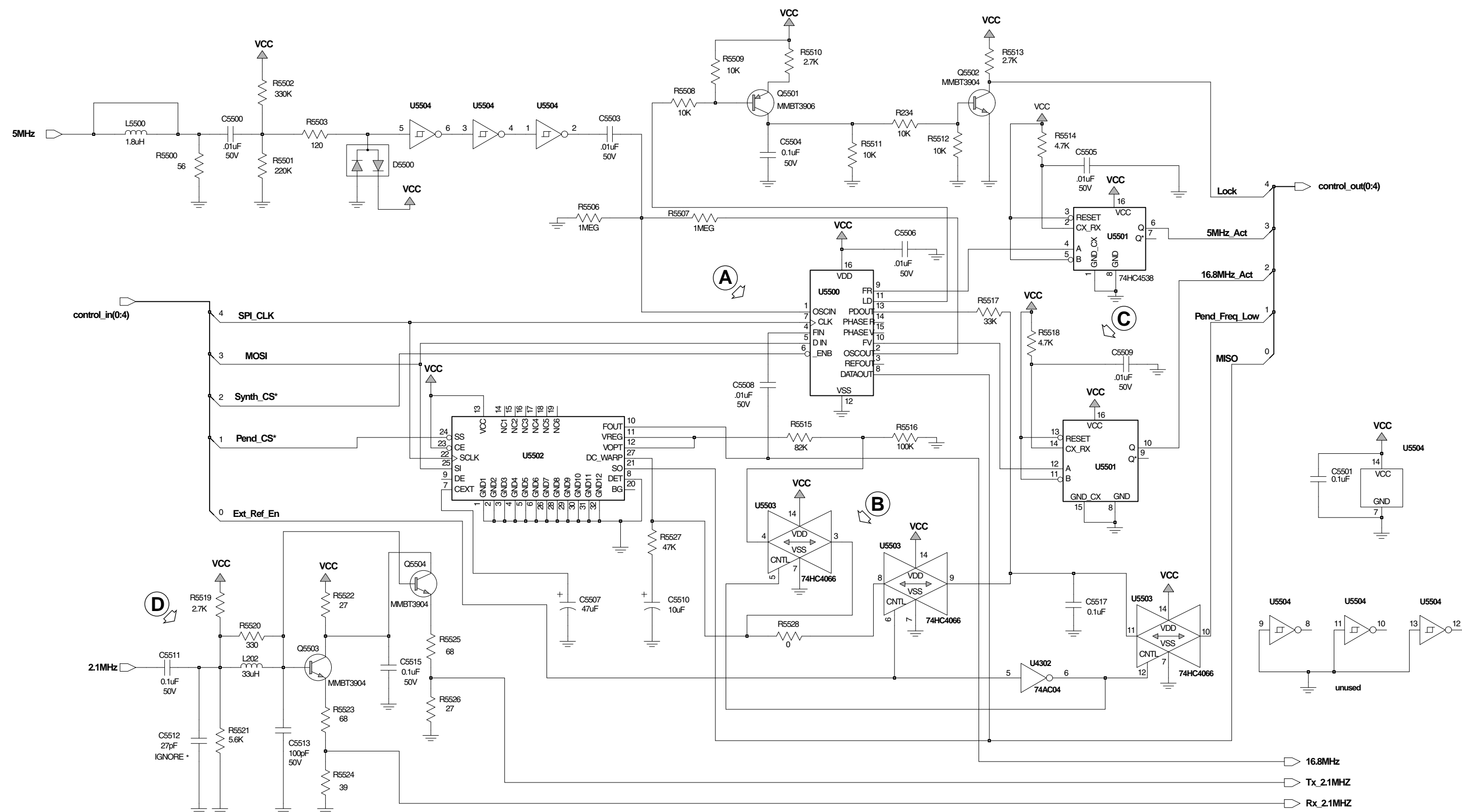
STATION CONTROL MODULE  
MODEL TCN6273N

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | U5500. MC145170. PLL chip that compares a divided down version or the 5MHz reference to a divided down version of the 16.8MHz clock generated by the Pendulum chip, U5502.   |
| Ⓑ           | U5503 pins 8 and 9. Analog gate which closes the phase locked loop (by Ext_Ref_En) causing the 16.8 MHZ clock to track the 5MHz external input by affecting the DC_WARP input to U5502. When this gate is open, gate 11/10 is closed. An essentially binary voltage will appear at "Pend_Freq_Low" indicating whether the Pendulum frequency is above or below 16.8MHz as referenced to the 5MHz external input. DC_WARP will be routed to a fixed voltage (gate 3/4) and the 16.8 MHz will not track the 5MHz signal. |
| Ⓒ           | U5501 looks at the outputs of U5500 corresponding to the 5 and 16.8 MHz signals and gives an indication of whether or not the signals are present.   |
| Ⓓ           | Buffers for 2.1MHz signal to prevent noise transfer between receiver and exciter.  |

SCHEMATIC IC’S TABLE-REFERENCE

| Reference | Type       | Description                                      |
|-----------|------------|--|
| U5500     | MC145170   | PLL Frequency Synthesizer, with Serial Interface |
| U5501     | MC74HC4538 | Dual Precision Monostable Multivibrator          |
| U5502     | Custom IC  | Reference Oscillator Module                      |
| U5503     | 74HC4066   | Quad Analog Switch/Multiplexer/Demultiplexer     |

STATION CONTROL MODULE  
MODEL TCN6273N



REFERENCE



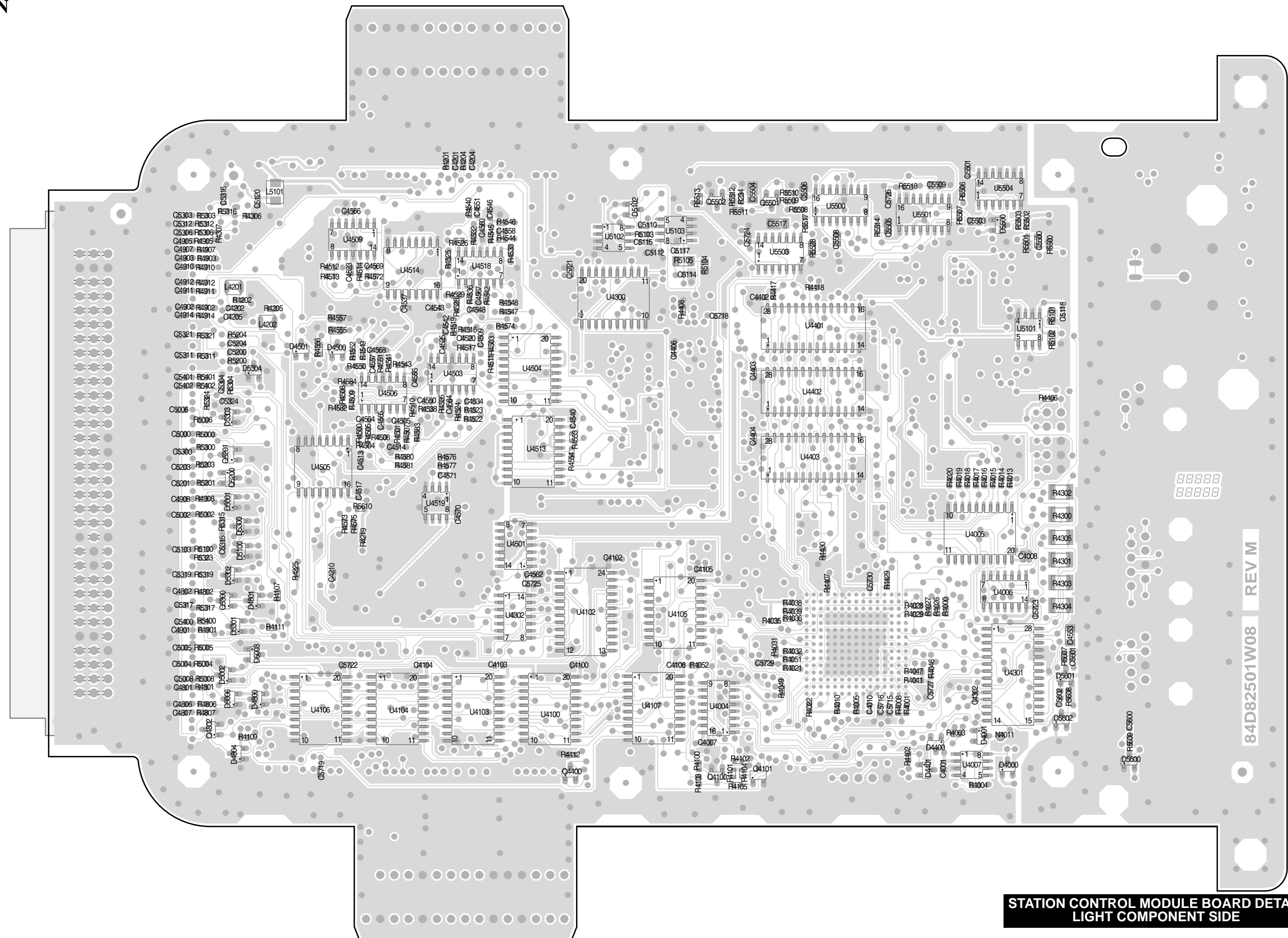
**STATION CONTROL MODULE**  
**MODEL TCN6273N**

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## STATION CONTROL MODULE BOARD DETAIL HEAVY COMPONENT SIDE

**MODEL TCN6273N**

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### STATION CONTROL MODULE BOARD DETAIL LIGHT COMPONENT SIDE

# Parts List

## TCN6273N STATION CONTROL MODULE

| REFERENCE SYMBOL                           | MOTOROLA PART NO. | DESCRIPTION             |
|--|-------------------|-------------------------|
| <b>CAPACITOR, FIXED: UF +/-10%; 100 V:</b> |                   |                         |
| UNLESS OTHERWISE STATED                    |                   |                         |
| C4001,4002                                 | 2113743E20        | Cap Chip .10 µF         |
| C4003                                      | 2311049A07        | 1 µF, +/-10%; 16V       |
| C4004 to 4008                              | 2113743E20        | Cap ChipCap Chip .10 µF |
| C4010                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4100 to 4106                              | 2113743E20        | Cap Chip .10 µF         |
| C4200 to 4205                              | 2113740F37        | 27 pF, +/-5%; 50V       |
| C4206                                      | 2113740F29        | 12 pF, +/-5%; 50V       |
| C4209 to 4212                              | 2113743E20        | Cap Chip .10 µF         |
| C4300,4301                                 | 2311049A45        | 10 µF, +/-10%; 35 V     |
| C4302                                      | 2113743E20        | Cap Chip .10 µF         |
| C4303,4304                                 | 2311049A45        | 10 µF, 35 V             |
| C4305 to 4310                              | 2113918A05        | 470 pF, +/-20%; 1000 V  |
| C4400                                      | 2113743E20        | Cap Chip .10 µF         |
| C4401                                      | 2113743E09        | 0.027 µF, 16V           |
| C4402 to 4405                              | 2113743E20        | Cap Chip .10 µF         |
| C4406                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4500,4501                                 | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4503                                      | 2113743E20        | Cap Chip .10 µF         |
| C4506                                      | 2113743E20        | Cap Chip .10 µF         |
| C4507                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4508                                      | 2311049A18        | 10 µF, 16V              |
| C4510                                      | 2311049A18        | 10 µF, 16V              |
| C4511                                      | 2113743A23        | Cap Chip .220 µF X7R    |
| C4512                                      | 2113743E20        | Cap Chip .10 µF         |
| C4516                                      | 2113743E12        | 0.047 µF 16V            |
| C4517                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4518                                      | 2113743E20        | Cap Chip .10 µF         |
| C4520                                      | 2113740F51        | 100 pF, +/-5%; 50V      |
| C4521                                      | 2311049A23        | 47 µF, +/-10%; 10 V     |
| C4522                                      | 2113741F05        | 150 pF, +/-5%; 50V      |
| C4523                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4525                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4526,4527                                 | 2311049A23        | 47 µF, +/-10%; 10 V     |
| C4528,4529                                 | 2113743E20        | Cap Chip .10 µF         |
| C4530,4531                                 | 2311049A18        | 10 µF, +/-10%; 16V      |
| C4532                                      | 2113743A23        | Cap Chip .220 µF X7R    |
| C4533                                      | 2113743E20        | Cap Chip .10 µF         |
| C4534                                      | 2113740F51        | 100 pF, +/-5%; 50V      |
| C4535                                      | 2113743E12        | 0.047 µF, +/-10%; 16V   |
| C4536                                      | 2311049A23        | 47 µF, +/-10%; 10 V     |
| C4537                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4538                                      | 2113743E20        | Cap Chip .10 µF         |
| C4540                                      | 2113743E20        | Cap Chip .10 µF         |
| C4541                                      | 2311049A08        | 1 µF, +/-10%; 35 V      |
| C4542,4543                                 | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4544                                      | 2113918A05        | 470 pF, +/-20%; 1000 V  |
| C4545                                      | 2113741F05        | 150 pF, +/-5%; 50V      |
| C4546                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4547                                      | 2311049A23        | 47 µF, +/-10%; 10 V     |
| C4548                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4549                                      | 2311049A18        | 10 µF, +/-10%; 16V      |
| C4550                                      | 2113740F51        | 100 pF, +/-5%; 50V      |
| C4551                                      | 2113743E20        | Cap Chip .10 µF         |
| C4552                                      | 2311049A23        | 47 µF, +/-10%; 10 V     |
| C4553                                      | 2113918A05        | 470 pF, +/-20%; 1000 V  |
| C4554                                      | 2113743E20        | Cap Chip .10 µF         |
| C4555                                      | 2113743E12        | 0.047 µF, +/-10%; 16V   |
| C4556                                      | 2311049A18        | 10 µF, +/-10%; 16V      |
| C4557                                      | 2113743E12        | 0.047 µF, +/-10%; 16V   |
| C4558                                      | 2113740F51        | 100 pF, +/-5%; 50V      |
| C4559                                      | 2311049A23        | 47 µF, +/-10%; 10 V     |
| C4560                                      | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4562 to 4567                              | 2113743E12        | 0.047 µF, +/-10%; 16V   |
| C4568,4569                                 | 2113741F49        | 0.01 µF, +/-5%; 50V     |
| C4570                                      | 2113743E12        | 0.047 µF, +/-10%; 16V   |
| C4571                                      | 2113740F51        | 100 pF, +/-5%; 50V      |
| C4600 to 4602                              | 2113740F31        | 15 pF, +/-5%; 50V       |
| C4603 to 4611                              | 2113740F37        | 27 pF, +/-5%; 50V       |
| C4612                                      | 2113740F31        | 15 pF, +/-5%; 50V       |
| C4613                                      | 2113740F37        | 27 pF, +/-5%; 50V       |
| C4614,4615                                 | 2113740F31        | 15 pF, +/-5%; 50V       |
| C4700 to 4702                              | 2113740F31        | 15 pF, +/-5%; 50V       |
| C4703 to 4709                              | 2113740F37        | 27 pF, +/-5%; 50V       |
| C4710                                      | 2113740F31        | 15 pF, +/-5%; 50V       |
| C4711                                      | 2113740F37        | 27 pF, +/-5%; 50V       |
| C4800 to 4808                              | 2113741F25        | 1000 pF, +/-5%; 50V     |
| C4900                                      | 2113741F17        | 470 pF, +/-5%; 50V      |
| C4901,4902                                 | 2113741F25        | 1000 pF, +/-5%; 50V     |
| C4903                                      | 2113741F17        | 470 pF, +/-5%; 50V      |

## TCN6273N STATION CONTROL MODULE

| REFERENCE SYMBOL                        | MOTOROLA PART NO. | DESCRIPTION                       |
|---|-------------------|-----------------------------------|
| C4904                                   | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C4905                                   | 2113741F17        | 470 pF, +/-5%; 50V                |
| C4906                                   | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C4907                                   | 2113741F17        | 470 pF, +/-5%; 50V                |
| C4908                                   | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C4909 to 4912                           | 2113741F17        | 470 pF, +/-5%; 50V                |
| C4913,4914                              | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5000 to 5009                           | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5100                                   | 2113743E20        | Cap Chip .10 µF                   |
| C5101                                   | 2380090M11        | 33 µF, +/-20%; 25V                |
| C5102                                   | 2113741F29        | 1500 pF, +/-5%; 50V               |
| C5103                                   | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5104                                   | 2113743E20        | Cap Chip .10 µF                   |
| C5105                                   | 2380090M11        | 33 µF, +/-20%; 25V                |
| C5106,5107                              | 2113743E20        | Cap Chip .10 µF                   |
| C5108                                   | 2380090M24        | 10 µF, +/-20%; 50 V               |
| C5109                                   | 2380090M11        | 33 µF, +/-20%; 25V                |
| C5110                                   | 2113743E20        | Cap Chip .10 µF                   |
| C5111                                   | 2380090M24        | 10 µF, +/-20%; 50 V               |
| C5112                                   | 2113741F49        | 0.01 µF, +/-5%; 50V               |
| C5113                                   | 2311049A21        | 22 µF, +/-10%; 20 V               |
| C5114,5115                              | 2113743E20        | Cap Chip .10 µF                   |
| C5116                                   | 2380090M11        | 33 µF, +/-20%; 25V                |
| C5117                                   | 2113743E20        | Cap Chip .10 µF                   |
| C5118                                   | 2113741F49        | 0.01 µF, +/-5%; 50V               |
| C5119 to 5121                           | 2113741F29        | 1500 pF, +/-5%; 50V               |
| C5200 to 5205                           | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5300,5301                              | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5303 to 5326                           | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5400 to 5402                           | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5500                                   | 2113741A45        | 0.01 µF, +/-5%; 50 V              |
| C5501                                   | 2113743E20        | Cap Chip .10 µF                   |
| C5503                                   | 2113741A45        | 0.01 µF, +/-5%; 50 V              |
| C5504                                   | 2113741B69        | 0.1 µF, +/-5%; 50 V               |
| C5505,5506                              | 2113741A45        | 0.01 µF, +/-5%; 50 V              |
| C5507                                   | 2311049A23        | 47 µF, +/-10%; 10 V               |
| C5508,5509                              | 2113741A45        | 0.01 µF, +/-5%; 50 V              |
| C5510                                   | 2311049A45        | 10 µF, +/-10%; 35 V               |
| C5511                                   | 2113741B69        | 0.1 µF, +/-5%; 50 V               |
| C5513                                   | 2113740A55        | 100 pF, +/-5%; 50 V               |
| C5515                                   | 2113741B69        | 0.1 µF, +/-5%; 50 V               |
| C5517                                   | 2113741B69        | 0.1 µF, +/-5%; 50 V               |
| C5600 to 5602                           | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5715                                   | 2113743E20        | Cap Chip .10 µF                   |
| C5716                                   | 2113741F49        | 0.01 µF, +/-5%; 50V               |
| C5717                                   | 2113741F25        | 1000 pF, +/-5%; 50V               |
| C5718 to 5732                           | 2113743E20        | Cap Chip .10 µF                   |
| C5734                                   | 2113743E20        | Cap Chip .10 µF                   |
| <b>DIODE: (SEE NOTE)</b>                |                   |                                   |
| D4000                                   | 4813833C11        | Diode Gen Purpose .2A,250V,A82    |
| D4001 to 4003                           | 4813825A05        | Hot Carrier                       |
| D4400 to 4402                           | 4813825A05        | Hot Carrier                       |
| D4500,4501                              | 4813825A05        | Hot Carrier                       |
| D4800 to 4805                           | 4813833C05        | dual 70 V                         |
| D5000 to 5002                           | 4813833C05        | dual 70 V                         |
| D5004 to 5006                           | 4813833C05        | dual 70 V                         |
| D5100                                   | 4813833C05        | dual 70 V                         |
| D5102                                   | 4813833C07        | dual 100W                         |
| D5200                                   | 4813833C05        | dual 70 V                         |
| D5300 to 5304                           | 4813833C05        | dual 70 V                         |
| D5500                                   | 4813833C05        | dual 70 V                         |
| D5600 to 5602                           | 4813833C05        | dual 70 V                         |
| <b>LIGHT EMITTING DIODE: (SEE NOTE)</b> |                   |                                   |
| DS5600                                  | 4882198T05        | Subminiature LED YEL SM           |
| DS5601 to 5603                          | 4882198T06        | Subminiature LED GRN SM           |
| DS5604                                  | 4882198T04        | Subminiature LED RED SM           |
| <b>CONNECTOR, RECEPTACLE:</b>           |                   |                                   |
| J2001                                   | 0982727X01        | Receptacle 29 PIN RA              |
| J3601                                   | 0982727X01        | Receptacle 29 PIN RA              |
| J5603                                   | 0982492W01        | BNC Conn. PCB Vertical Receptacle |
| <b>COIL, INDUCTOR:</b>                  |                   |                                   |
| L202                                    | 2411087A44        | 33 µH                             |
| L4200                                   | 2462587N71        | 1800 nH, +/-5%                    |
| L4201,4202                              | 2462587N69        | 1200 NH, 5%                       |
| L5100 to 5102                           | 2484657R01        | Ferrite Bead                      |

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TCN6273N STATION CONTROL MODULE

| REFERENCE SYMBOL   | MOTOROLA PART NO. | DESCRIPTION                    |
|--|-------------------|--------------------------------|
| CONNECTOR, PLUG:   |                   |                                |
| P3   | 2883562R04        | Plug, Eurocard 96 Pin R A      |
| P5600  | 0982566W03        | Jack Mod Vert 8-Pin            |
| P5601  | 0982566W02        | Jack Mod Vert 4-Pin            |
| P5602  | 0982566W03        | Jack Mod Vert 8-Pin            |
| TRANSISTOR: (SEE NOTE)                                     |                   |                                |
| Q4100  | 4813824A10        | NPN                            |
| Q4101  | 4884955T01        | NPN                            |
| Q4400,4401   | 4813824A10        | NPN                            |
| Q4402  | 4813824A17        | PNP                            |
| Q4403  | 4813824A10        | NPN                            |
| Q4800 to 4802  | 4884955T01        | NPN                            |
| Q5200,5201   | 4884955T01        | NPN                            |
| Q5300  | 4813824A11        | NPN                            |
| Q5301  | 4884955T01        | NPN                            |
| Q5501  | 4813824A17        | PNP                            |
| Q5502 to 5504  | 4813824A10        | NPN                            |
| RESISTOR, FIXED: +/-5%; 1/16 W:<br>UNLESS OTHERWISE STATED |                   |                                |
| R234   | 0662057A73        | Chip Res 10K Ohms              |
| R4000  | 0662057A73        | Chip Res 10K Ohms              |
| R4001  | 0662057A65        | Chip Res 4700 Ohms             |
| R4002,4003   | 0662057A73        | Chip Res 10K Ohms              |
| R4004  | 0662057A51        | Chip Res 1200 Ohms             |
| R4005 to 4010  | 0662057A73        | Chip Res 10K Ohms              |
| R4013 to 4020  | 0662057A51        | Chip Res 1200 Ohms             |
| R4021,4022   | 0662057A89        | Chip Res 47K Ohms              |
| R4026 to 4041  | 0662057A89        | Chip Res 47K Ohms              |
| R4044 to 4049  | 0662057A89        | Chip Res 47K Ohms              |
| R4051  | 0662057A73        | Chip Res 10K Ohms              |
| R4052  | 0662057A65        | Chip Res 4700 Ohms             |
| R4100  | 0662057A49        | Chip Res 1000 Ohms             |
| R4101  | 0662057A65        | Chip Res 4700 Ohms             |
| R4102  | 0662057B47        | Chip Res 0 Ohms +/-0.050 Ohms  |
| R4104  | 0662057A65        | Chip Res 4700 Ohms             |
| R4105  | 0662057B47        | Chip Res 0 Ohms +/-0.050 Ohms  |
| R4106 to 4112  | 0662057A73        | Chip Res 10K Ohms              |
| R4200,4201   | 0662057A09        | Chip Res 22 Ohms               |
| R4202  | 0662057A27        | Chip Res 120 Ohms              |
| R4203,4204   | 0662057A09        | Chip Res 22 Ohms               |
| R4205  | 0662057A27        | Chip Res 120 Ohms              |
| R4206 to 4209  | 0662057A97        | Chip Res 100K Ohms             |
| R4210  | 0662057A51        | Chip Res 1200 Ohms             |
| R4211  | 0662057A59        | Chip Res 2700 Ohms             |
| R4212 to 4214  | 0662057A73        | Chip Res 10K Ohms              |
| R4215 to 4217  | 0662057A45        | Chip Res 680 Ohms              |
| R4219  | 0662057A65        | Chip Res 4700 Ohms             |
| R4220  | 0662057A61        | Chip Res 3300 Ohms             |
| R4221  | 0662057A73        | Chip Res 10K Ohms              |
| R4222  | 0662057A89        | Chip Res 47K Ohms              |
| R4223  | 0662057A65        | Chip Res 4700 Ohms             |
| R4224  | 0662057A77        | Chip Res 15K Ohms              |
| R4225 to 4227  | 0662057A73        | Chip Res 10K Ohms              |
| R4228  | 0662057A97        | Chip Res 100K Ohms             |
| R4300 to 4305  | 0611072A25        | 100 ohms, +/-5%; 1/4 W         |
| R4306,4307   | 0662057A97        | Chip Res 100K Ohms             |
| R4400  | 0662057A73        | Chip Res 10K Ohms              |
| R4401,4402   | 0662057A65        | Chip Res 4700 Ohms             |
| R4403 to 4406  | 0662057A73        | Chip Res 10K Ohms              |
| R4407,4408   | 0662057A89        | Chip Res 10K Ohms              |
| R4409  | 0662057A57        | Chip Res 2200 Ohms             |
| R4410  | 0662057A35        | Chip Res 270 Ohms              |
| R4411  | 0662057A37        | Chip Res 330 Ohms              |
| R4412  | 0662057A55        | Chip Res 1800 Ohms             |
| R4413  | 0662057A59        | Chip Res 2700 Ohms             |
| R4414  | 0662057A55        | Chip Res 1800 Ohms             |
| R4415,4416   | 0662057A73        | Chip Res 10K Ohms              |
| R4417 to 4419  | 0662057A89        | Chip Res 47K Ohms              |
| R4429,4430   | 0662057A73        | Chip Res 10K Ohms              |
| R4502  | 0611079A13        | Res Fixed Chip 3.0 5 1/10W A/P |
| R4512  | 0662057A87        | Chip Res 39K Ohms              |
| R4513,4514   | 0662057A73        | Chip Res 10K Ohms              |
| R4515  | 0662057A88        | Chip Res 43K Ohms              |
| R4516  | 0662057A81        | Chip Res 22K Ohms              |
| R4517,4518   | 0662057A88        | Chip Res 43K Ohms              |
| R4519  | 0662057A79        | Chip Res 18K Ohms              |
| R4520  | 0662057A97        | Chip Res 100K Ohms             |
| R4521  | 0611079A13        | Res Fixed Chip 3.0 5 1/10W A/P |
| R4522,4523   | 0662057A88        | Chip Res 43K Ohms              |

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| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                   |
|------------------|-------------------|-------------------------------|
| R4524            | 0662057A81        | Chip Res 22K Ohms             |
| R4525,4526       | 0662057A73        | Chip Res 10K Ohms             |
| R4527            | 0662057A88        | Chip Res 43K Ohms             |
| R4528,4529       | 0662057A73        | Chip Res 10K Ohms             |
| R4530            | 0662057A09        | Chip Res 22 Ohms              |
| R4531            | 0662057A88        | Chip Res 43K Ohms             |
| R4532,4533       | 0662057A73        | Chip Res 10K Ohms             |
| R4534            | 0662057A97        | Chip Res 100K Ohms            |
| R4535            | 0662057A81        | Chip Res 22K Ohms             |
| R4536            | 0662057A73        | Chip Res 10K Ohms             |
| R4537            | 0662057A80        | Chip Res 20K Ohms             |
| R4538            | 0662057A95        | Chip Res 82K Ohms             |
| R4539            | 0662057A57        | Chip Res 2200 Ohms            |
| R4540            | 0662057A43        | Chip Res 560 Ohms             |
| R4541 to 4543    | 0662057A73        | Chip Res 10K Ohms             |
| R4544            | 0662057A89        | Chip Res 47K Ohms             |
| R4545            | 0662057A77        | Chip Res 15K Ohms             |
| R4546            | 0662057A81        | Chip Res 22K Ohms             |
| R4547            | 0662057A85        | Chip Res 33K Ohms             |
| R4548, 4549      | 0662057A73        | Chip Res 10K Ohms             |
| R4550            | 0662057A80        | Chip Res 20K Ohms             |
| R4551,4552       | 0662057A73        | Chip Res 10K Ohms             |
| R4553            | 0662057A90        | Chip Res 51K Ohms             |
| R4554            | 0662057A87        | Chip Res 39K Ohms             |
| R4555            | 0611079D51        | Res Chip 332.0 1/10W 1%       |
| R4556            | 0611079D73        | Res Chip 562.0 1/10W 1%       |
| R4557            | 0611079D51        | Res Chip 332.0 1/10W 1%       |
| R4558,4559       | 0662057A80        | Chip Res 20K Ohms             |
| R4560            | 0662057A73        | Chip Res 10K Ohms             |
| R4561            | 0662057A80        | Chip Res 20K Ohms             |
| R4562            | 0662057A73        | Chip Res 10K Ohms             |
| R4563            | 0662057A80        | Chip Res 20K Ohms             |
| R4564            | 0662057A73        | Chip Res 10K Ohms             |
| R4565            | 0662057A80        | Chip Res 20K Ohms             |
| R4566            | 0662057A73        | Chip Res 10K Ohms             |
| R4567            | 0662057A80        | Chip Res 20K Ohms             |
| R4568            | 0662057A73        | Chip Res 10K Ohms             |
| R4569            | 0662057A80        | Chip Res 20K Ohms             |
| R4570            | 0662057A73        | Chip Res 10K Ohms             |
| R4571            | 0662057A80        | Chip Res 20K Ohms             |
| R4572            | 0662057A49        | Chip Res 1000 Ohms            |
| R4573            | 0662057A71        | Chip Res 8200 Ohms            |
| R4575            | 0662057A77        | Chip Res 15K Ohms             |
| R4576,4577       | 0662057A73        | Chip Res 10K Ohms             |
| R4580 to 4584    | 0662057B47        | Chip Res 0 Ohms +/-0.050 Ohms |
| R4600 to 4605    | 0662057A09        | Chip Res 22 Ohms              |
| R4606            | 0662057A49        | Chip Res 1000 Ohms            |
| R4607,4608       | 0662057A09        | Chip Res 22 Ohms              |
| R4609            | 0662057A45        | Chip Res 680 Ohms             |
| R4610            | 0662057A09        | Chip Res 22 Ohms              |
| R4700 to 4706    | 0662057A09        | Chip Res 22 Ohms              |
| R4707            | 0662057A45        | Chip Res 680 Ohms             |
| R4708            | 0662057A09        | Chip Res 22 Ohms              |
| R4800            | 0662057A09        | Chip Res 22 Ohms              |
| R4801 to 4804    | 0662057A41        | Chip Res 470 Ohms             |
| R4805            | 0662057A09        | Chip Res 22 Ohms              |
| R4806            | 0662057A41        | Chip Res 470 Ohms             |
| R4807            | 0662057A09        | Chip Res 22 Ohms              |
| R4808 to 4810    | 0662057A41        | Chip Res 470 Ohms             |
| R4900            | 0662057A25        | Chip Res 100 Ohms             |
| R4901,4902       | 0662057A41        | Chip Res 470 Ohms             |
| R4903            | 0662057A25        | Chip Res 100 Ohms             |
| R4904            | 0662057A41        | Chip Res 470 Ohms             |
| R4905            | 0662057A25        | Chip Res 100 Ohms             |
| R4906            | 0662057A41        | Chip Res 470 Ohms             |
| R4907            | 0662057A25        | Chip Res 100 Ohms             |
| R4908            | 0662057A41        | Chip Res 470 Ohms             |
| R4909 to 4912    | 0662057A25        | Chip Res 100 Ohms             |
| R4913,4914       | 0662057A41        | Chip Res 470 Ohms             |
| R5000 to 5009    | 0662057A41        | Chip Res 470 Ohms             |
| R5100            | 0662057A41        | Chip Res 470 Ohms             |
| R5101            | 0611079F01        | Res Chip 1.00K 1/10 W         |
| R5102            | 0611079F93        | Res Chip 9.09K 1/10W 1% 0805  |
| R5103            | 0662057A01        | Chip Res 10 Ohms              |
| R5104            | 0611079F01        | Res Chip 1.00K 1/10 W         |
| R5105            | 0611077F94        | 10.7K, +/-1%; 1/8 W           |
| R5200            | 0662057A41        | Chip Res 470 Ohms             |
| R5201            | 0662057A09        | Chip Res 22 Ohms              |
| R5202            | 0662057A41        | Chip Res 470 Ohms             |
| R5203            | 0662057A09        | Chip Res 22 Ohms              |
| R5204,5205       | 0662057A41        | Chip Res 470 Ohms             |

## TCN6273N STATION CONTROL MODULE

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                   |
|------------------|-------------------|-------------------------------|
| R5300,5301       | 0662057A41        | Chip Res 470 Ohms             |
| R5303 to 5319    | 0662057A41        | Chip Res 470 Ohms             |
| R5321 to 5324    | 0662057A41        | Chip Res 470 Ohms             |
| R5325            | 0611072A30        | 160 Ohms, +/-5%; 1/4W         |
| R5326,5327       | 0662057A41        | Chip Res 470 Ohms             |
| R5400 to 5402    | 0662057A41        | Chip Res 470 Ohms             |
| R5501            | 0662057B06        | Chip Res 220K Ohms            |
| R5502            | 0662057B10        | Chip Res 330K Ohms            |
| R5503            | 0662057A27        | Chip Res 120 Ohms             |
| R5506,5507       | 0662057B22        | Chip ResChip Res 1.0 MEG Ohms |
| R5508,5509       | 0662057A73        | Chip Res 10K Ohms             |
| R5510            | 0662057A59        | Chip Res 2700 Ohms            |
| R5511,5512       | 0662057A73        | Chip Res 10K Ohms             |
| R5513            | 0662057A59        | Chip Res 2700 Ohms            |
| R5514            | 0662057A65        | Chip Res 4700 Ohms            |
| R5515            | 0662057A95        | Chip Res 82K Ohms             |
| R5516            | 0662057A97        | Chip Res 100K Ohms            |
| R5517            | 0662057A85        | Chip Res 33K Ohms             |
| R5518            | 0662057A65        | Chip Res 4700 Ohms            |
| R5519            | 0662057A59        | Chip Res 2700 Ohms            |
| R5520            | 0662057A37        | Chip Res 330 Ohms             |
| R5521            | 0662057A67        | Chip Res 5600 Ohms            |
| R5522            | 0662057A11        | Chip Res 27 Ohms              |
| R5523            | 0662057A21        | Chip Res 68 Ohms              |
| R5524            | 0611079A40        | 39 ohms, 1/10 W               |
| R5525            | 0662057A21        | Chip Res 68 Ohms              |
| R5526            | 0662057A11        | Chip Res 27 Ohms              |
| R5527            | 0662057A89        | Chip Res 47K Ohms             |
| R5528            | 0611079A01        | 0 ohms, 1/10 W                |
| R5601 to 5605    | 0611079A58        | 220 ohms, 1/10 W              |
| R5606 to 5608    | 0662057A41        | Chip Res 470 Ohms             |
| R5609            | 0662057A09        | Chip Res 22 Ohms              |
| R5610            | 0662057A63        | Chip Res 3900 Ohms            |

### INTEGRATED CIRCUIT: (SEE NOTE)

|               |            |   |
|---------------|------------|---|
| U4000         | 5182561W01 | IC DCHP-68356-OMPAC                             |
| U4001,4002    | 5184830T01 | IC 128KX8 SRAM -628128- SM                      |
| U4003         | 5191056C03 | IC Mem Flash 1 MEGX8 SM                         |
| U4004         | 5113808A20 | 1 of 8 Decoder/Demultiplexer                    |
| U4005         | 5113808A40 | Octal 3-State Non-Inverter Line Driver/Receiver |
| U4006         | 5113808A07 | Quad 2-Input AND Gate                           |
| U4007         | 5182928X01 | IC Supervisor CKT MAX703                        |
| U4100         | 5113805A60 | Octal D, Flip-Flop                              |
| U4101,4102    | 5113805A35 | IC Decoder/Demux 1OF16 HC154DW                  |
| U4103 to 4105 | 5113805A60 | Octal D, Flip-Flop                              |
| U4106         | 5113805A54 | Octal Buffer Line Driver/Receiver               |
| U4107         | 5113805A60 | Octal D, Flip-Flop                              |
| U4200,4201    | 5113808A14 | Quad 2-Input OR Gate                            |
| U4202         | 5182374Y01 | 8BIT A/D Converter (SPI Interface)              |
| U4203         | 5113805A42 | 8-Bit Shifter Register                          |
| U4204         | 5113808A07 | Quad 2-Input AND Gate                           |
| U4300         | 5113805A54 | Octal Buffer Line Driver/Receiver               |
| U4301         | 5183376X01 | IC, +5V RS232 XCVR, MAX211E                     |
| U4302         | 5113808A05 | Hex Inverter                                    |
| U4400         | 5184625T06 | IC, ASIC Outlaw Glue                            |
| U4401 to 4403 | 5184531T08 | IC SRAM 32X8 12NS Ext Temp                      |
| U4501         | 5113808A16 | Dual D-type Flip-Flop                           |
| U4502         | 5182718X01 | IC CODE C -1027- SM                             |
| U4503         | 5113819A05 | High Performance, Single Supply                 |
| U4505         | 5113805A84 | Mux/Demux, Dual 4-Channel Analog                |
| U4506         | 5113819A05 | High Performance, Single Supply                 |
| U4507         | 5113805A84 | Mux/Demux, Dual 4-Channel Analog                |
| U4508         | 5182802R38 | Digital Pot Converter                           |
| U4509         | 5113819A14 | IC QD OP AMP _33204_                            |
| U4510         | 5182718X01 | IC CODE C -1027- SM                             |
| U4511         | 5113805A85 | Mux/Demux, Trip 2-Channel Analog                |
| U4513         | 5184743T01 | CODEC Pulse Code Modulation                     |
| U4514         | 5182802R38 | Digital Pot Converter                           |
| U4518         | 5113819A05 | High Performance, Single Supply                 |
| U4519         | 5113818A14 | IC DL OP AMP RAIL TO RAIL                       |
| U5100         | 5113816G04 | +5V Voltage Regulator                           |
| U5101         | 5113816A22 | IC LOW DRPOUT UPWR V RGLTR 5V                   |
| U5102         | 5182276R73 | IC DUAL MOSFET DVR _33151_                      |
| U5103         | 5113816A22 | IC LOW DRPOUT UPWR V RGLTR 5V                   |
| U5500         | 5184717T01 | Synthesizer with Serial Interface               |
| U5501         | 5113805A89 | Monostable Multivibrator, Dual Precision        |
| U5502         | 5184726T02 | Reference Oscillator Module                     |
| U5503         | 5113805A86 | Quad Analog Multiplexer/Demultiplexer           |
| U5504         | 5113808A13 | Hex Inverter Schmitt Trigger                    |

## TCN6273N STATION CONTROL MODULE

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION                                   |
|------------------|-------------------|---|
|                  | 7582172Y01        | NON-REFERENCED ITEMS<br>Bumper Guard for LEDs |

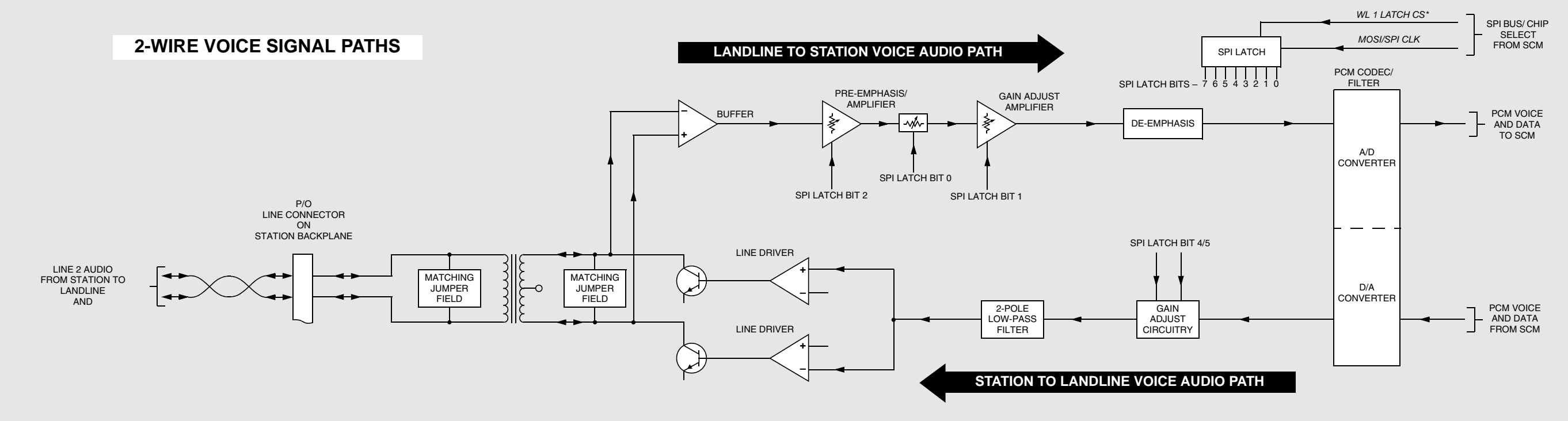
**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

**Note:** Parts lists differences for board versions H, and D are detailed in a table on the following page. The TCN6273H parst list in this manual section reflects the latest production build of the station control module.

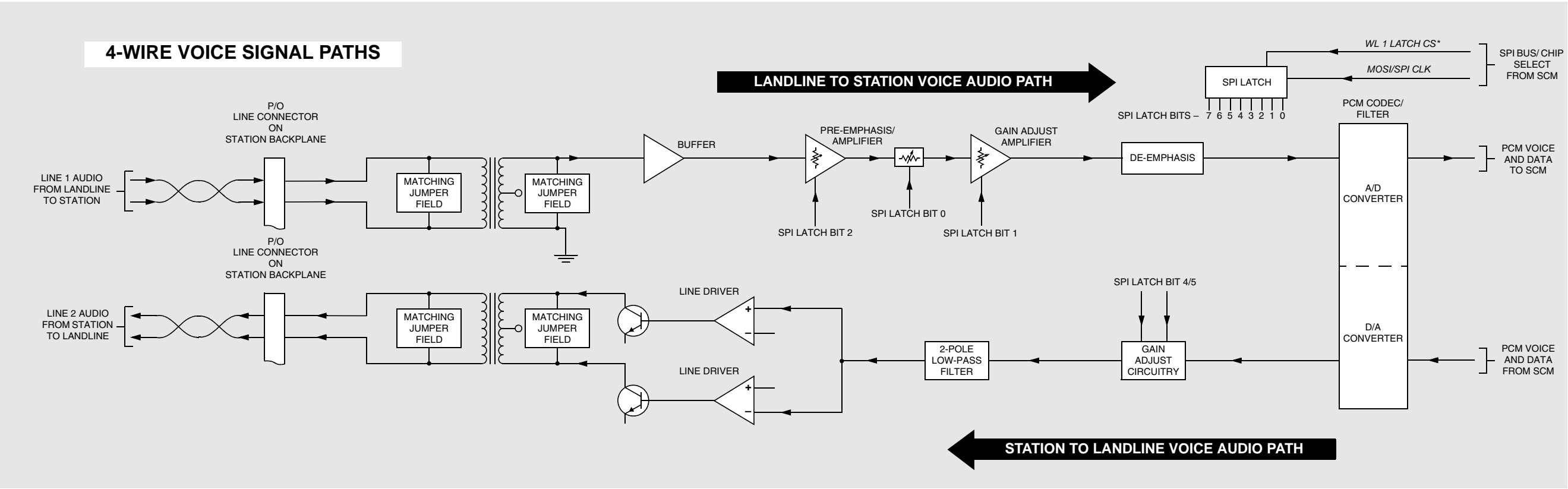
**TCN6273H/N Station Control Module Changes**

NOTE: The following table details the changes that have been made on the control board from Issue H to N.

| Reference Symbol | Board Issue | Motorola Part No. | Description                 |
|------------------|-------------|-------------------|-----------------------------|
| U4003            | H           | 5191056C03        | IC Mem Flash 1<br>MEGX 8 SM |
|                  | K           | 5183440Y01        | IC Mem Flash 1<br>MEGX 8    |



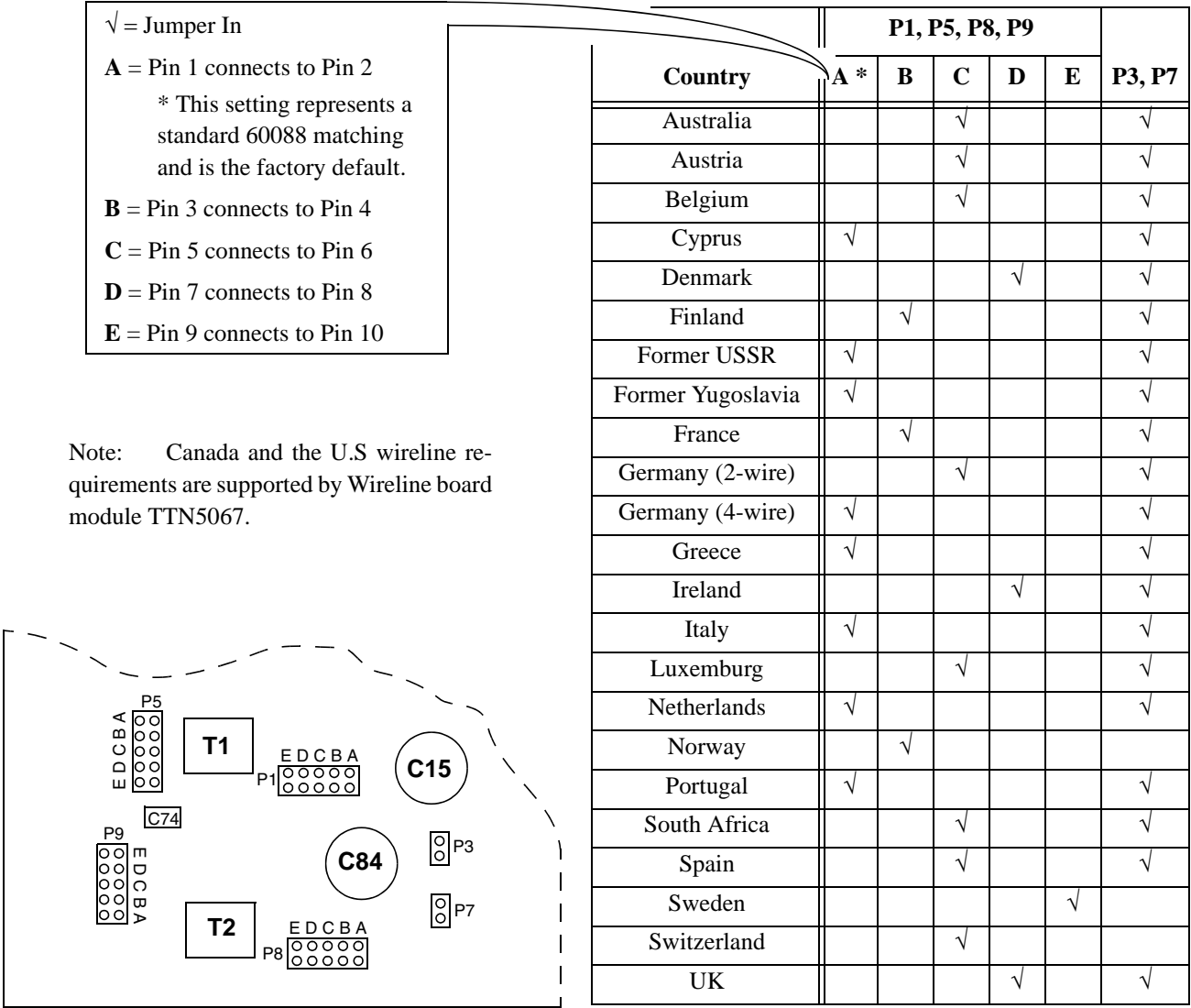
TTN5066B 2-WIRE VOICE AUDIO PATH FUNCTIONAL BLOCK DIAGRAM



TTN5066B 4-WIRE VOICE AUDIO PATH FUNCTIONAL BLOCK DIAGRAM



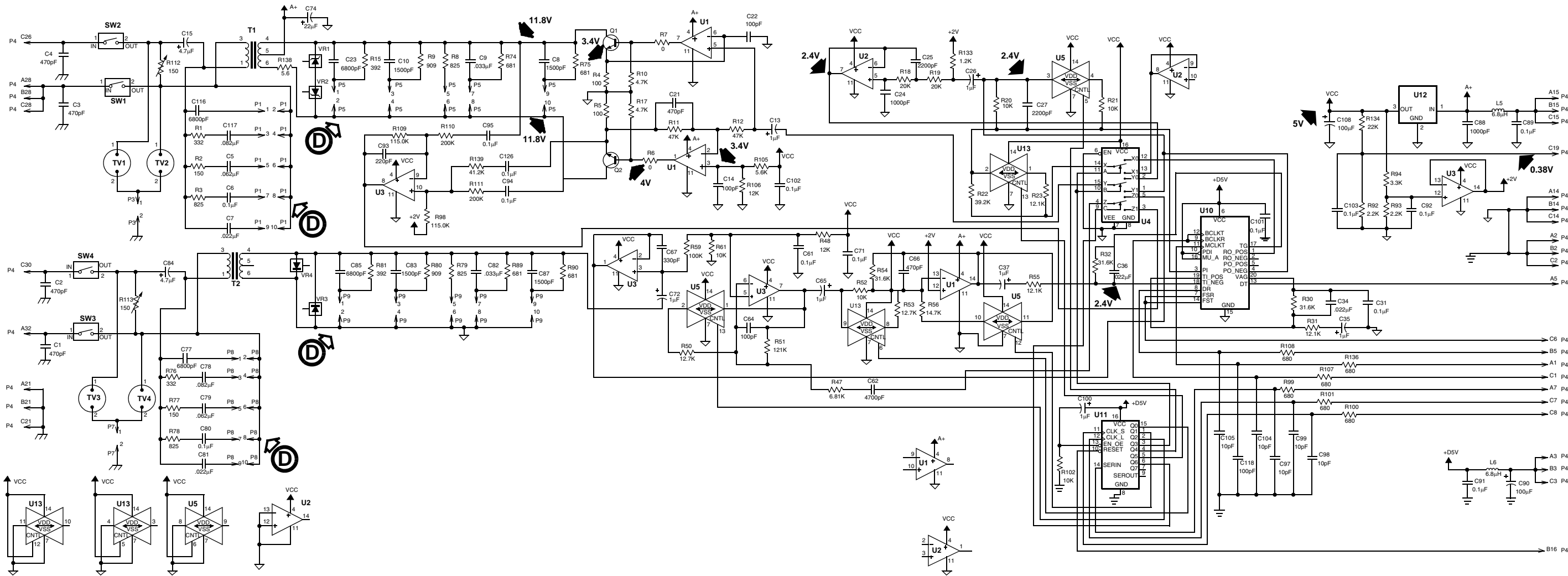
EURO WIB MODULE  
MODEL TTN5066B



| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | The SPI LATCH U11 is used to configure the WIB by means of several MUXs and Analog switches. The output pins 1 to 6 and pin 15 drive the select inputs of the configuration path switches and amplification step switches. On the TTN 5068A (8-Wire) a second SPI Latch (U15) is used to configure the two additional paths in the same manner as above. |
| Ⓑ           | The continuous Master Clock and the Bit Clock are essential for the correct data transfer and data sampling. Both are square waves with the duty cycle 1:1 with a period of 3,9 μsec.  |
| Ⓒ           | The continuous Frame Sync Clock starts the PCM serial Block Transfer. The waveform is a needle pulse train with a repetition rate of 125 μsec.   |
| Ⓓ           | The Jumper fields P1, P5, P8 and P9 have to have in any case jumpers set. When running the board without any jumpers the correct function cannot be guaranteed. (undefined matching). The default jumper setting is for 600 Ohms (Position A)  |

| Configuration Mode | U11/Pin# | State (Volt) | Remarks                |
|--------------------|----------|--------------|------------------------|
| 4-Wire Mode        | 6        | 0            |                        |
| 2-Wire Mode        | 6        | 5.1          | Only active line is L2 |
| Analog Voice Mode  | 3        | 0            |                        |

EURO WIB MODULE  
MODEL TTN5066B

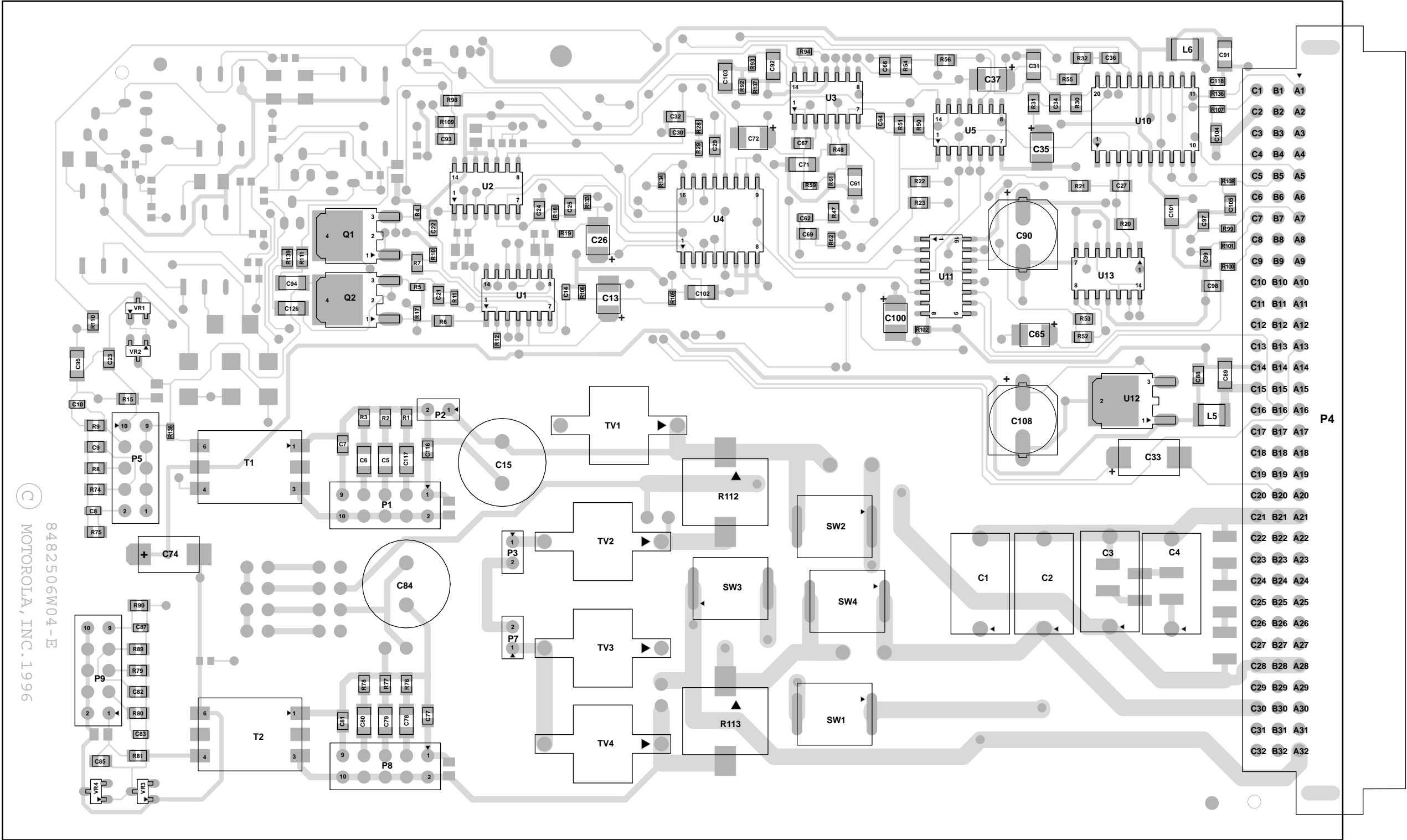


TTN5066B 4-WIRE EURO WIB SCHEMATIC

**EURO WIB MODULE**  
**MODEL TTN5066B**

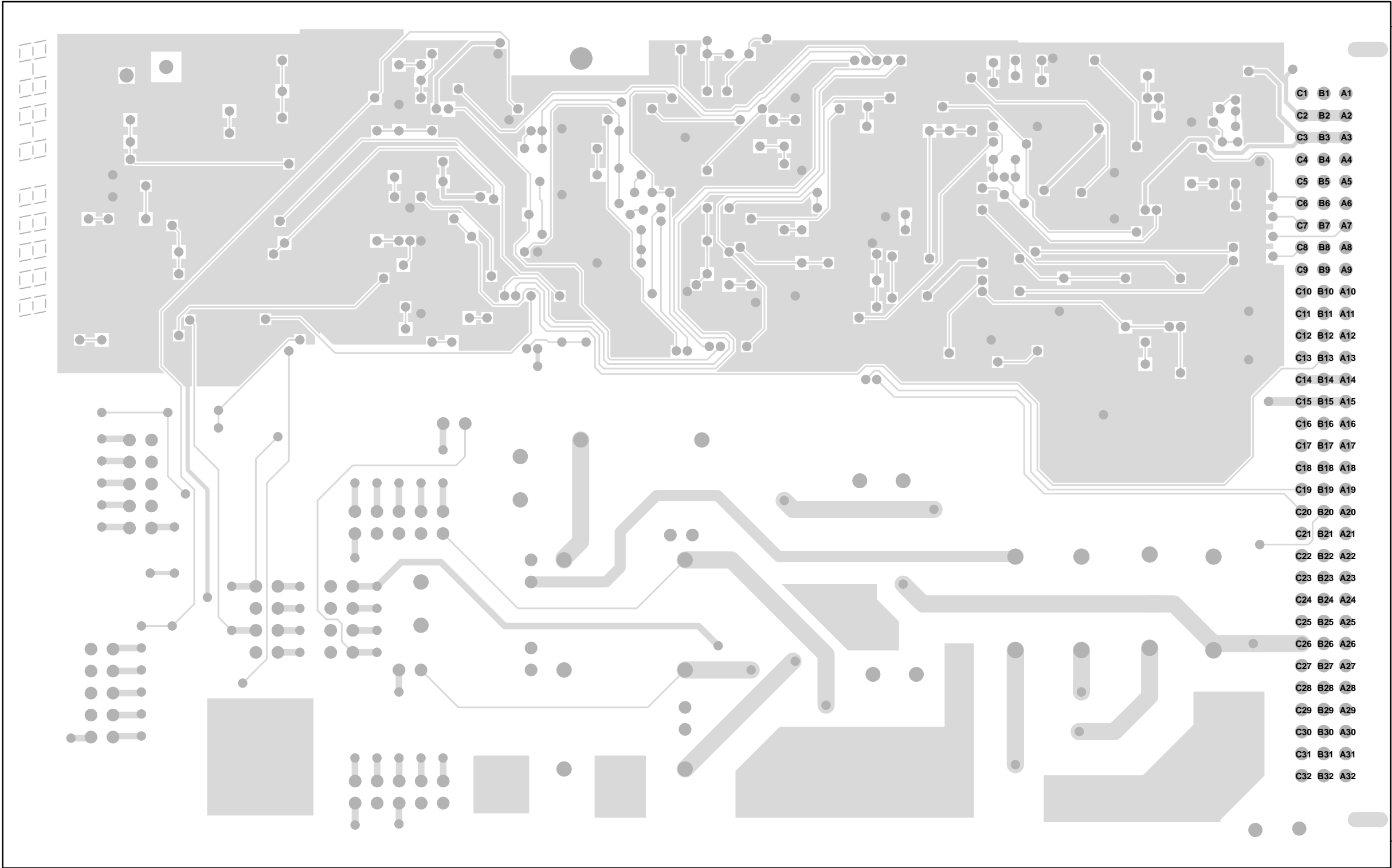
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EURO WIB MODULE  
MODEL TTN5066B



TTN5066B 4-WIRE VOICE AUDIO BOARD DETAIL-TOP

EURO WIB MODULE  
MODEL TTN5066B



TTN5066B 4-WIRE VOICE AUDIO BOARD DETAIL-BOTTOM

# Parts List

## TTN5066B 4-Wire Euro WIB

| REFERENCE SYMBOL                         | MOTOROLA PART NO. | DESCRIPTION                    |
|--|-------------------|--------------------------------|
| <b>CAPACITOR, FIXED: MF ±10%; 100 V:</b> |                   |                                |
| UNLESS OTHERWISE STATED                  |                   |                                |
| C3,4                                     | 2183405X01        | Capacitor Ceramic High Voltage |
| C5                                       | 2113741B64        | 0.062 µF, ±5%; 50V             |
| C6                                       | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C7                                       | 2113741A53        | 0.022 µF, ±5%; 50 V            |
| C8                                       | 2113741F29        | 1500 pF, ±5%; 50V              |
| C9                                       | 2113741A57        | 0.033 µF, ±5%; 50 V            |
| C10                                      | 2113741F29        | 1500 pF, ±5%; 50V              |
| C13                                      | 2311049A08        | 1 µF, ±10%; 35 V               |
| C14                                      | 2113740F51        | 100 pF, ±5%; 50V               |
| C15                                      | 2382174V01        | 4.7 µF, ±20%; 200 V            |
| C21                                      | 2113740A71        | 470 pF, ±5%; 50 V              |
| C22                                      | 2113740F51        | 100 pF, ±5%; 50V               |
| C23                                      | 2113741A41        | 6800 pF, ±5%; 50 V             |
| C24                                      | 2113740A79        | 1000 pF, ±5%; 50 V             |
| C25                                      | 2113741A29        | 2200 pF, ±5%; 50 V             |
| C26                                      | 2311049A08        | 1 µF, ±10%; 35 V               |
| C27                                      | 2113741A29        | 2200 pF, ±5%; 50 V             |
| C31                                      | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C34                                      | 2113741A53        | 0.022 µF, ±5%; 50 V            |
| C35                                      | 2311049A08        | 1 µF, ±10%; 35 V               |
| C36                                      | 2113741A53        | 0.022 µF, ±5%; 50 V            |
| C37                                      | 2311049A08        | 1 µF, ±10%; 35 V               |
| C61                                      | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C62                                      | 2113741F41        | 4700 pF, ±5%; 50V              |
| C64                                      | 2113740F51        | 100 pF, ±5%; 50V               |
| C65                                      | 2311049A08        | 1 µF, ±10%; 35 V               |
| C66                                      | 2113740A71        | 470 pF, ±5%; 50 V              |
| C67                                      | 2113740A67        | 330 pF, ±5%; 50 V              |
| C71                                      | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C72                                      | 2311049A08        | 1 µF, ±10%; 35 V               |
| C74                                      | 2311049A21        | 22 µF, ±10%; 20 V              |
| C77                                      | 2113741A41        | 6800 pF, ±5%; 50 V             |
| C78                                      | 2113741B67        | 0.082 µF, ±5%; 50V             |
| C79                                      | 2113741B64        | 0.062 µF, ±5%; 50V             |
| C80                                      | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C81                                      | 2113741A53        | 0.022 µF, ±5%; 50 V            |
| C82                                      | 2113741A57        | 0.033 µF, ±5%; 50 V            |
| C83                                      | 2113741F29        | 1500 pF, ±5%; 50V              |
| C84                                      | 2382174V01        | 4.7 µF, ±20%; 200 V            |
| C85                                      | 2113741A41        | 6800 pF, ±5%; 50 V             |
| C87                                      | 2113741F29        | 1500 pF, ±5%; 50V              |
| C88                                      | 2113740A79        | 1000 pF, ±5%; 50 V             |
| C89                                      | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C90                                      | 2380090M36        | CAP 100 µF 25V                 |
| C91,92                                   | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C93                                      | 2113740A63        | 220 pF, ±5%; 50 V              |
| C94,95                                   | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C97 thru 99                              | 2113740A29        | 10 pF, ±5%; 50 V               |
| C100                                     | 2311049A08        | 1 µF, ±10%; 35 V               |
| C101 thru 103                            | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| C104                                     | 2113740A55        | 100 pF, ±5%; 50 V              |
| C105                                     | 2113740A29        | 10 pF, ±5%; 50 V               |
| C108                                     | 2380090M36        | CAP 100 µF 25V                 |
| C116                                     | 2113741A41        | 6800 pF, ±5%; 50 V             |
| C117                                     | 2113741B67        | 0.082 µF, ±5%; 50V             |
| C118                                     | 2113741F01        | 100 pF, ±5%; 50V               |
| C126                                     | 2113741B69        | 0.1 µF, ±5%; 50 V              |
| <b>COIL, INDUCTOR:</b>                   |                   |                                |
| L5,6                                     | 2411087B36        | 6.8 µH                         |
| <b>CONNECTOR, PLUG:</b>                  |                   |                                |
| P4                                       | 2883562R04        | Plug, Eurocard 96 Pin R A      |
| <b>TRANSISTOR: (SEE NOTE)</b>            |                   |                                |
| Q1,2                                     | 4813822A07        | NPN                            |
| <b>RESISTOR, FIXED: ±5%; 1/16W:</b>      |                   |                                |
| UNLESS OTHERWISE STATED                  |                   |                                |
| R1                                       | 0611079D51        | Chip Res 332.0 1/10W 1%        |
| R2                                       | 0611079D18        | Chip Res 150.0 1/10W 1%        |
| R3                                       | 0611079D89        | Chip Res 825.0 1/10W 1%        |
| R4,5                                     | 0662057A25        | Chip Res 100 Ohms              |
| R6,7                                     | 0611079A01        | 0 ohms, ±5%; 1/10 W            |
| R8                                       | 0611079D89        | Chip Res 825.0 1/10W 1%        |
| R9                                       | 0611079D93        | 909 ohms, 1/10 W; ±1%          |
| R10                                      | 0662057A65        | Chip Res 4700 Ohms             |
| R11,12                                   | 0662057A89        | Chip Res 47K Ohms              |
| R15                                      | 0611079D58        | Chip Res 392.0 1/10W 1%        |

## TTN5066B 4-Wire Euro WIB

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                               |
|---------------------------------------|-------------------|---|
| R17                                   | 0662057A65        | Chip Res 4700 Ohms                        |
| R18,19                                | 0662057A80        | Chip Res 20K Ohms                         |
| R20,21                                | 0611079G01        | 10k, ±1%; 1/10 W                          |
| R22                                   | 0611079G49        | 31.6K, 1/10W; ±1%                         |
| R23                                   | 0611079G09        | 12.1K, 1/10 W; ±1%                        |
| R30                                   | 0611079G49        | 31.6K, 1/10W; ±1%                         |
| R31                                   | 0611079G09        | 12.1K, 1/10 W; ±1%                        |
| R32                                   | 0611079G49        | 31.6K, 1/10W; ±1%                         |
| R47                                   | 0611079F81        | Chip Res 6.81K 1/10W 1% 0805              |
| R48                                   | 0611079B01        | 12K, ±5%; 1/10 W                          |
| R50                                   | 0611079G11        | 12.7K, 1/10W; ±1%                         |
| R51                                   | 0611079E09        | Resistor: chip 121.0K 1/10 W 1%           |
| R52                                   | 0611079G01        | 10k, ±1%; 1/10 W                          |
| R53                                   | 0611079G11        | 12.7K, 1/10W; ±1%                         |
| R54                                   | 0611079G49        | 31.6K, 1/10W; ±1%                         |
| R55                                   | 0611079G09        | 12.1K, 1/10 W; ±1%                        |
| R56                                   | 0611079G17        | Chip Res 14.7K 1/10W 1% 0805              |
| R59                                   | 0662057A97        | Chip Res 100K Ohms                        |
| R61                                   | 0662057A73        | Chip Res 10K Ohms                         |
| R74,75                                | 0611079D81        | Chip Res 681.0 1/10W 1%                   |
| R76                                   | 0611079D51        | Chip Res 332.0 1/10W 1%                   |
| R77                                   | 0611079D18        | Chip Res 150.0 1/10W 1%                   |
| R78,79                                | 0611079D89        | Chip Res 825.0 1/10W 1%                   |
| R80                                   | 0611079D93        | 909 ohms, 1/10 W; ±1%                     |
| R81                                   | 0611079D58        | Chip Res 392.0 1/10W 1%                   |
| R89,90                                | 0611079D81        | Chip Res 681.0 1/10W 1%                   |
| R92,93                                | 0662057A57        | Chip Res 2200 Ohms                        |
| R94                                   | 0662057A61        | Chip Res 3300 Ohms                        |
| R98                                   | 0611079E07        | Chip Res 115.0K 1/10W 1%                  |
| R99 thru 101                          | 0662057A45        | Chip Res 680 Ohms                         |
| R102                                  | 0662057A73        | Chip Res 10K Ohms                         |
| R105                                  | 0662057A67        | Chip Res 5600 Ohms                        |
| R106                                  | 0662057A75        | Chip Res 12K Ohms                         |
| R107,108                              | 0662057A45        | Chip Res 680 Ohms                         |
| R109                                  | 0611079E07        | Chip Res 115.0K 1/10W 1%                  |
| R110,111                              | 0611079E30        | 200K, 1/10 W; ±1%                         |
| R112,113                              | 0682527W01        | Varistor Silicon Oxide                    |
| R133                                  | 0662057A51        | Chip Res 1200 Ohms                        |
| R134                                  | 0662057A81        | Chip Res 22K Ohms                         |
| R136                                  | 0662057A45        | Chip Res 680 Ohms                         |
| R138                                  | 0662057B66        | Chip Res 5.6 Ohms                         |
| R139                                  | 0611079G60        | Resistor chip 41.2K 1/10 W 1%             |
| <b>SWITCH:</b>                        |                   |   |
| SW1 thru 4                            | 0683408X01        | Polyswitch C.M.                           |
| <b>TRANSFORMER:</b>                   |                   |   |
| T1,2                                  | 2584422T02        | Transformer Line Matching                 |
| <b>SPARK GAP: (SEE NOTE)</b>          |                   |   |
| TV1 thru 4                            | 8083379X01        | Surge Suppressor, GLASSBY, 230V           |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |   |
| U1                                    | 5113819A04        | Quad Operational Amplifier                |
| U2                                    | 5113819A05        | High Performance, Single Supply           |
| U3                                    | 5113819A04        | Quad Operational Amplifier                |
| U4                                    | 5113805A85        | Mux/Demux, Trip 2-Channel Analog          |
| U5                                    | 5113805A86        | Quad Analog Multiplexer/Demultiplexer     |
| U10                                   | 5184743T01        | CODEC Pulse Code Modulation               |
| U11                                   | 5113805A75        | IC 8 BIT SER TO PAR/PAR HC595             |
| U12                                   | 5113816A07        | 5-Volt Positive Regulator                 |
| U13                                   | 5113805A86        | Quad Analog Multiplexer/Demultiplexer     |
| <b>VOLTAGE REGULATOR: (SEE NOTE)</b>  |                   |   |
| VR1,2                                 | 4813830A18        | Zener, 6.8V                               |
| VR3,4                                 | 4813833C10        | 0.1A, 70 V                                |
| <b>NON-REFERENCED ITEMS</b>           |                   |   |
|                                       | 0984728L01        | Shorting Jumper: 2-contact (used with P1) |
|                                       | 0984728L01        | Shorting Jumper: 2-contact (used with P3) |
|                                       | 0984728L01        | Shorting Jumper: 2-contact (used with P5) |
|                                       | 0984728L01        | Shorting Jumper: 2-contact (used with P7) |
|                                       | 0984728L01        | Shorting Jumper: 2-contact (used with P8) |
|                                       | 0984728L01        | Shorting Jumper: 2-contact (used with P9) |
|                                       | 2880001R02        | plug: 2-pin header (used with P3)         |
|                                       | 2880001R02        | plug: 2-pin header (used with P7)         |
|                                       | 2880001S05        | plug: 10-contact (used with P1)           |
|                                       | 2880001S05        | plug: 10-contact (used with P5)           |
|                                       | 2880001S05        | plug: 10-contact (used with P8)           |
|                                       | 2880001S05        | plug: 10-contact (used with P9)           |
|                                       | 5482006W01        | Label, PCB barcode                        |

68P81094E27-D

Parts List (Sheet 7 of 8)

12/26/01

TTN5066B 4-Wire Euro WIB

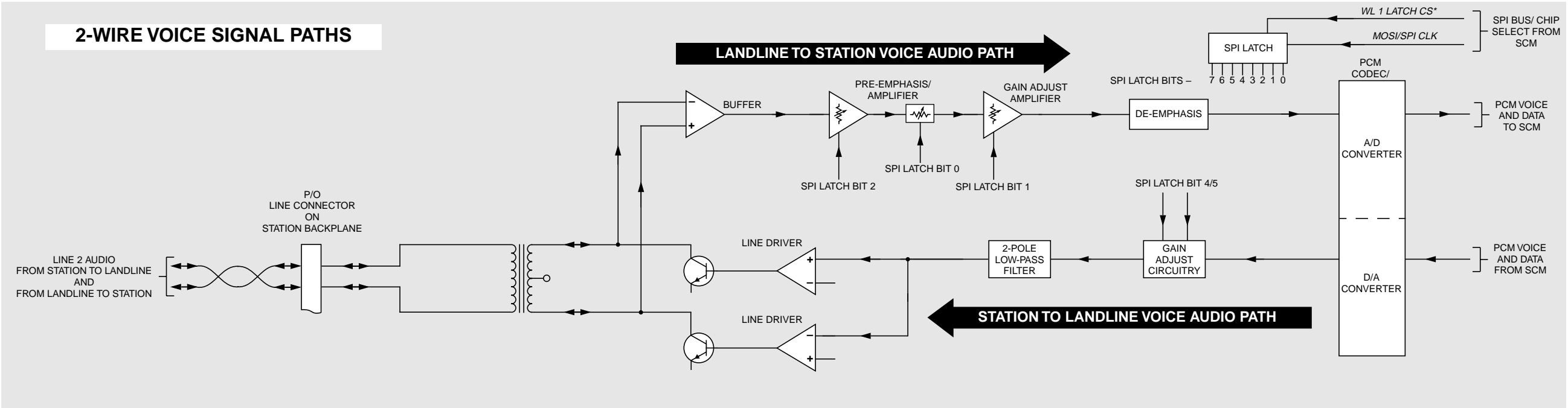
| REFERENCE<br>SYMBOL | MOTOROLA<br>PART NO. | DESCRIPTION                         |
|---------------------|----------------------|-------------------------------------|
|                     | 5482006W02           | ribbon, thermal transfer            |
|                     | 5484960T01           | Label, barcode: 6.3 x 12.7mm, white |
|                     | 5484960T02           | LABEL BLANK BARCODE                 |

**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

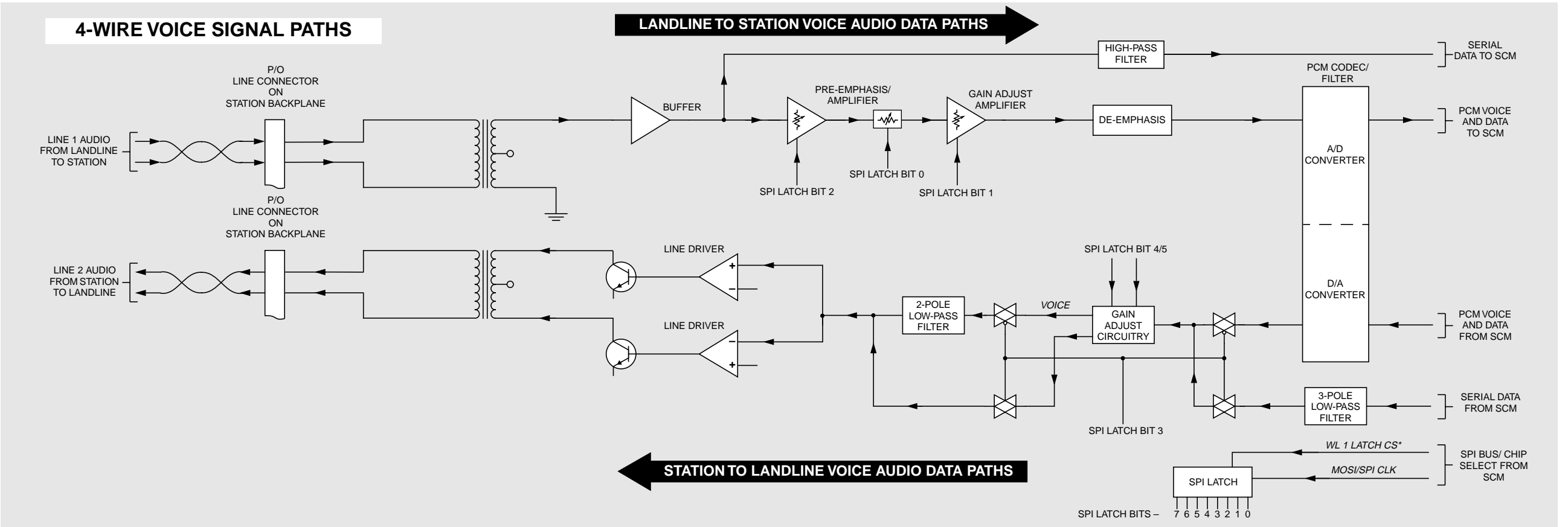
TTN5066B 4-Wire Euro WIB

| REFERENCE<br>SYMBOL | MOTOROLA<br>PART NO. | DESCRIPTION |
|---------------------|----------------------|-------------|
|---------------------|----------------------|-------------|

4-WIRE WIB MODULE  
MODEL TTN5067B



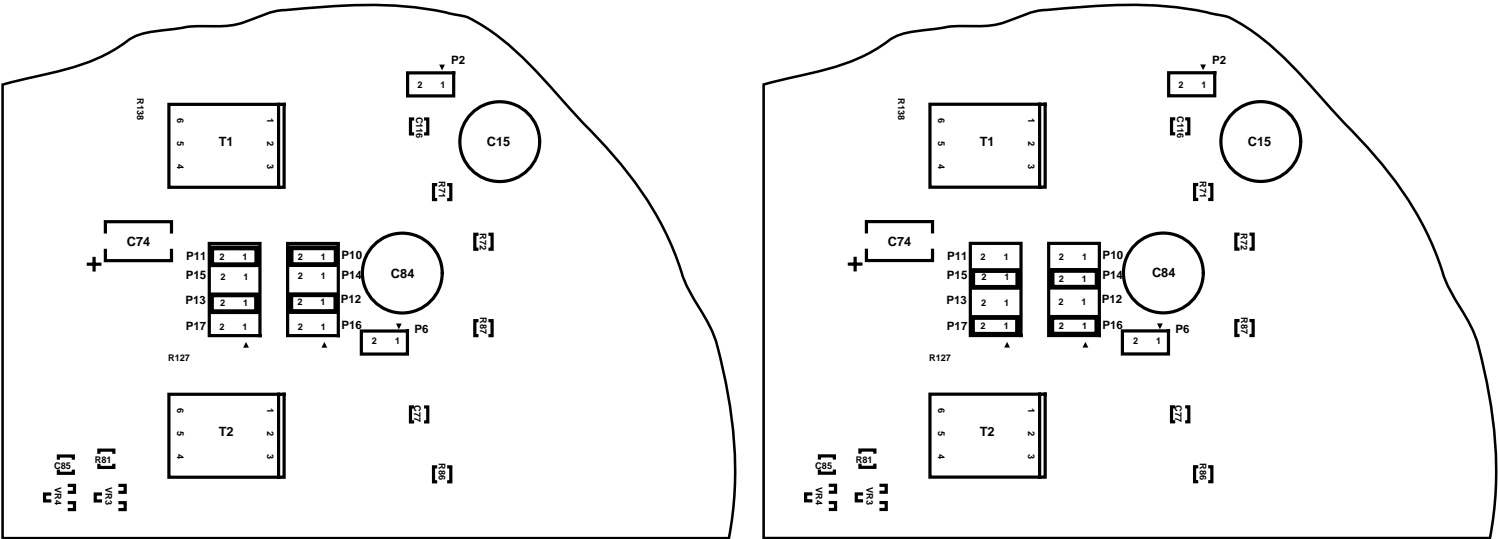
TTN5067B 2-WIRE VOICE AUDIO PATH FUNCTIONAL BLOCK DIAGRAM



TTN5067B 4-WIRE VOICE AUDIO DATA PATH FUNCTIONAL BLOCK DIAGRAM



4-WIRE WIB MODULE  
MODEL TTN5067B



DC Remote Control 4-Wire Configuration

DC Remote Control 2-Wire Configuration

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| A           | The SPI LATCH U11 is used to configure the WIB by means of several MUXs and Analog switches.<br>The output pins 1 to 6 and pin 15 drive the select inputs of the configuration path switches and amplification step switches.<br>On the TTN 5068A (8-Wire) a second SPI Latch (U15) is used to configure the two additional paths in the same manner as above. |
| B           | The continuous Master Clock and the Bit Clock are essential for the correct data transfer and data sampling.<br>Both are square waves with the duty cycle 1:1 with a period of 3,9 μsec.   |
| C           | The continuous Frame Sync Clock starts the PCM serial Block Transfer<br>The waveform is a needle pulse train with a repetition rate of 125 μsec.   |

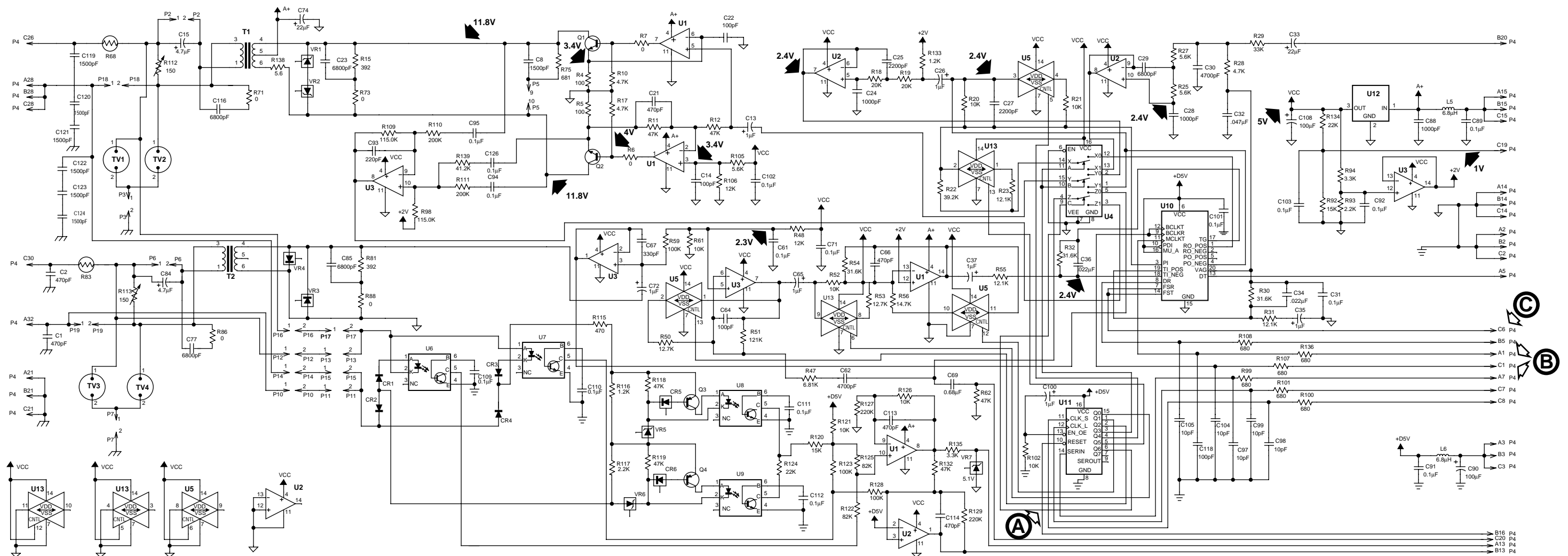
| Configuration Mode         | U11/Pin# | State (Volt) | Remarks                |
|----------------------------|----------|--------------|------------------------|
| 4-Wire Mode                | 6        | 0            |                        |
| 2-Wire Mode                | 6        | 5.1          | Only active line is L2 |
| Analog Voice Mode          | 3        | 0            |                        |
| Broadband Mode (SECURENET) | 3        | 5.1          |                        |

| Remote Control Type  | P10, P11 | P12, P13 | P14, P15 | P16, P17 |
|--|----------|----------|----------|----------|
| DC Remote Control 2-wire configuration                     | out      | out      | in       | in       |
| DC Remote Control 4-wire configuration                     | in       | in       | out      | out      |
| Tone or Binary Remote Control 2-wire/4-wire configurations | out      |          |          |          |

**Note: DC Remote Control functionality is not supported by the station software.**

# 4-WIRE WIB MODULE

## MODEL TTN5067B



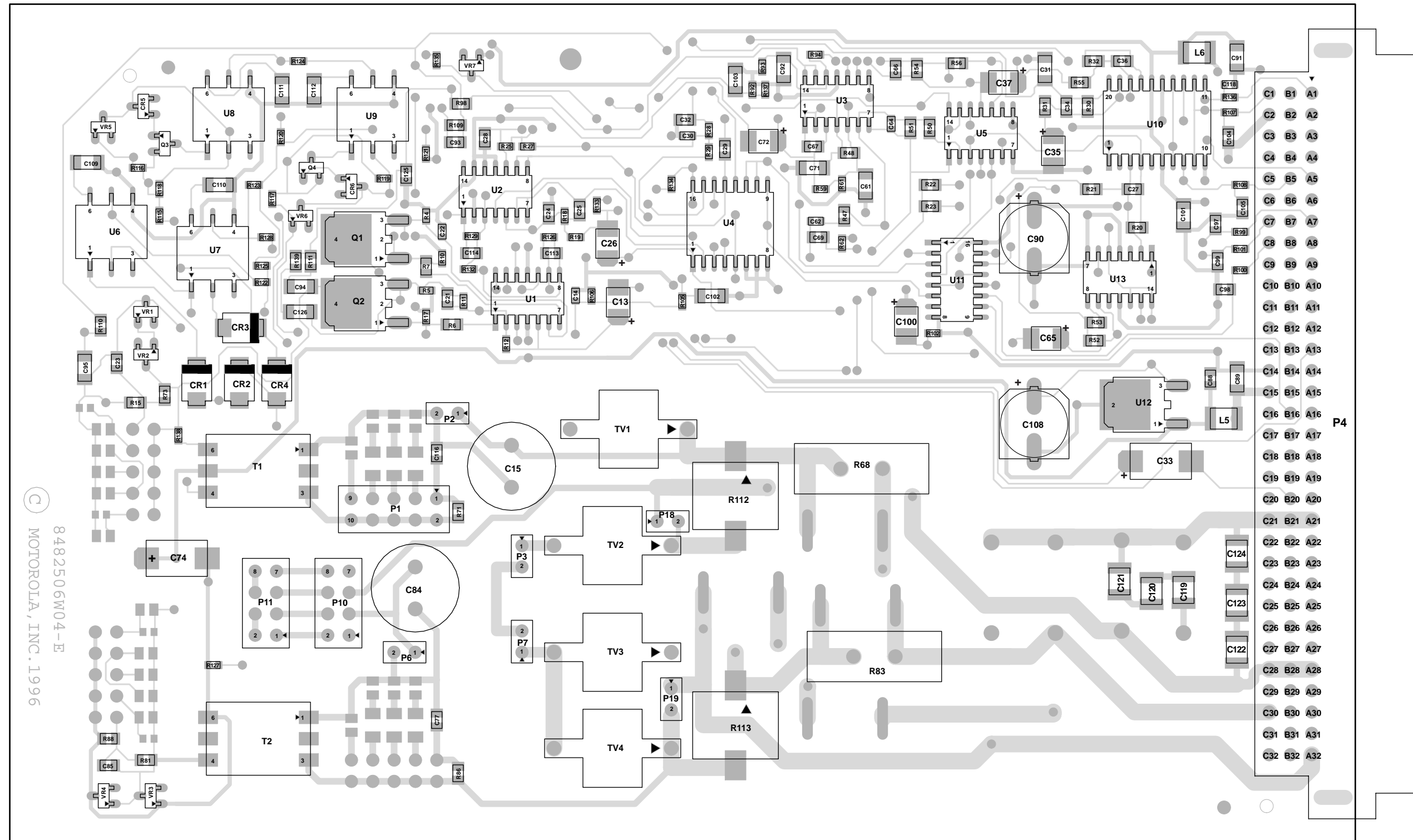
TTN5067B 4-WIRE VOICE AUDIO DATA PATH SCHEMATIC

**4-WIRE WIB MODULE**  
**MODEL TTN5067B**

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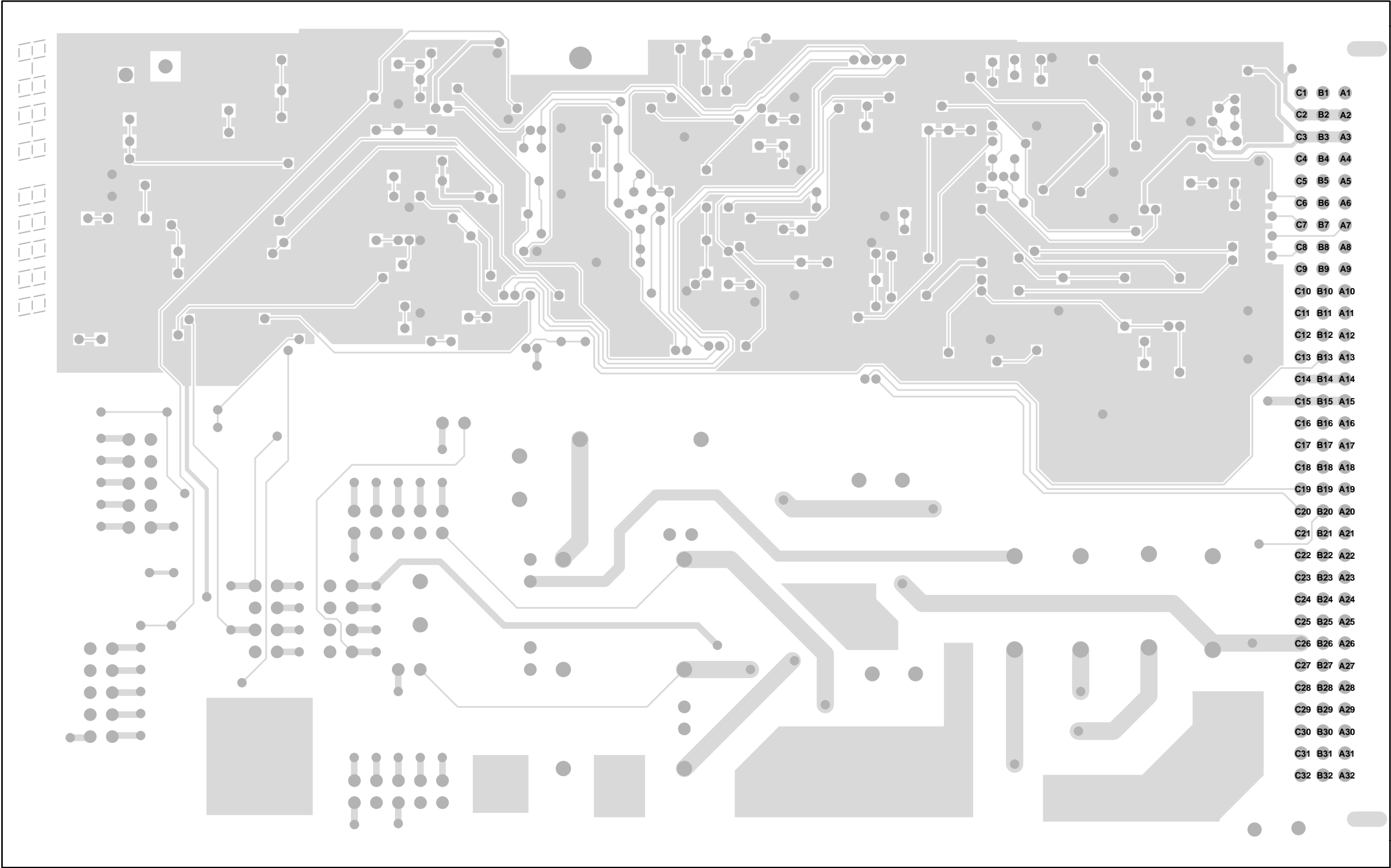
# 4-WIRE WIB MODULE

## MODEL TTN5067B



TTN5067B 4-WIRE VOICE AUDIO DATA BOARD DETAIL-TOP

4-WIRE WIB MODULE  
MODEL TTN5067B



TTN5067B 4-WIRE VOICE AUDIO DATA BOARD DETAIL-BOTTOM

# Parts List

## TTN5067B 4-Wire WIB

| REFERENCE SYMBOL   | MOTOROLA PART NO. | DESCRIPTION                       |
|--|-------------------|-----------------------------------|
| <b>CAPACITOR, FIXED: <math>\mu</math>F <math>\pm</math>10%; 100 V:</b> |                   |                                   |
| UNLESS OTHERWISE STATED  |                   |                                   |
| C13  | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C14  | 2113740F51        | 100 pF, $\pm$ 5%; 50V             |
| C15  | 2382174V01        | 4.7 $\mu$ F, $\pm$ 20%; 200 V     |
| C21  | 2113740A71        | 470 pF, $\pm$ 5%; 50 V            |
| C22  | 2113740F51        | 100 pF, $\pm$ 5%; 50V             |
| C23  | 2113741A41        | 6800 pF, $\pm$ 5%; 50 V           |
| C24  | 2113740A79        | 1000 pF, $\pm$ 5%; 50 V           |
| C25  | 2113741A29        | 2200 pF, $\pm$ 5%; 50 V           |
| C26  | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C27  | 2113741A29        | 2200 pF, $\pm$ 5%; 50 V           |
| C28  | 2113740A79        | 1000 pF, $\pm$ 5%; 50 V           |
| C29  | 2113741A41        | 6800 pF, $\pm$ 5%; 50 V           |
| C30  | 2113741F41        | 4700 pF, $\pm$ 5%; 50V            |
| C31  | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C32  | 2113741A61        | 0.047 $\mu$ F, $\pm$ 5%; 50 V     |
| C33  | 2311049A21        | 22 $\mu$ F, $\pm$ 10%; 20 V       |
| C34  | 2113741A53        | 0.022 $\mu$ F, $\pm$ 5%; 50 V     |
| C35  | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C36  | 2113741A53        | 0.022 $\mu$ F, $\pm$ 5%; 50 V     |
| C37  | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C61  | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C62  | 2113741F41        | 4700 pF, $\pm$ 5%; 50V            |
| C64  | 2113740F51        | 100 pF, $\pm$ 5%; 50V             |
| C65  | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C66  | 2113740A71        | 470 pF, $\pm$ 5%; 50 V            |
| C67  | 2113740A67        | 330 pF, $\pm$ 5%; 50 V            |
| C69  | 2113743F15        | Cap Chip .680 $\mu$ F 16V +80-20% |
| C71  | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C72  | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C74  | 2311049A21        | 22 $\mu$ F, $\pm$ 10%; 20 V       |
| C77  | 2113741A41        | 6800 pF, $\pm$ 5%; 50 V           |
| C84  | 2382174V01        | 4.7 $\mu$ F, $\pm$ 20%; 200 V     |
| C85  | 2113741A41        | 6800 pF, $\pm$ 5%; 50 V           |
| C88  | 2113740A79        | 1000 pF, $\pm$ 5%; 50 V           |
| C89  | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C90  | 2380090M36        | Cap 100 $\mu$ F 25V               |
| C91,92   | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C93  | 2113740A63        | 220 pF, $\pm$ 5%; 50 V            |
| C94,95   | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C97 thru 99  | 2113740A29        | 10 pF, $\pm$ 5%; 50 V             |
| C100   | 2311049A08        | 1 $\mu$ F, $\pm$ 10%; 35 V        |
| C101 thru 103  | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C104   | 2113740A55        | 100 pF, $\pm$ 5%; 50 V            |
| C105   | 2113740A29        | 10 pF, $\pm$ 5%; 50 V             |
| C108   | 2380090M36        | Cap 100 $\mu$ F 25V               |
| C109 thru 112  | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| C113,114   | 2113740A71        | 470 pF, $\pm$ 5%; 50 V            |
| C116   | 2113741A41        | 6800 pF, $\pm$ 5%; 50 V           |
| C118   | 2113741F01        | 100 pF, $\pm$ 5%; 50V             |
| C119 thru 124  | 2113918A11        | Cap Chip 1500PF 1000V 20% X7R     |
| C126   | 2113741B69        | 0.1 $\mu$ F, $\pm$ 5%; 50 V       |
| <b>DIODE: (SEE NOTE)</b>   |                   |                                   |
| CR1 thru 4   | 4813833B06        | 1A; 600 V                         |
| CR5,6  | 4813833C10        | 0.1A, 70 V                        |
| <b>COIL, INDUCTOR:</b>   |                   |                                   |
| L5,6   | 2411087B36        | 6.8 $\mu$ H                       |
| <b>CONNECTOR, PLUG:</b>  |                   |                                   |
| P4   | 2883562R04        | Plug, Eurocard 96 PIN R A         |
| <b>TRANSISTOR: (SEE NOTE)</b>  |                   |                                   |
| Q1,2   | 4813822A07        | NPN                               |
| Q3,4   | 4813824A18        | PNP                               |
| <b>RESISTOR, FIXED: <math>\pm</math>5%; 1/16W:</b>                     |                   |                                   |
| UNLESS OTHERWISE STATED  |                   |                                   |
| R4,5   | 0662057A25        | Chip Res 100 Ohms                 |
| R6,7   | 0611079A01        | O ohms, $\pm$ 5%; 1/10 W          |
| R10  | 0662057A65        | Chip Res 4700 Ohms                |
| R11,12   | 0662057A89        | Chip Res 47K Ohms                 |
| R15  | 0611079D58        | Chip Res 392.0 1/10W 1%           |
| R17  | 0662057A65        | Chip Res 4700 Ohms                |
| R18,19   | 0662057A80        | Chip Res 20K Ohms                 |
| R20,21   | 0611079G01        | 10k, $\pm$ 1%; 1/10 W             |
| R22  | 0611079G49        | 31.6K, 1/10W; $\pm$ 1%            |
| R23  | 0611079G09        | 12.1K, 1/10 W; $\pm$ 1%           |
| R25  | 0662057A67        | Chip Res 5600 Ohms                |

## TTN5067B 4-Wire WIB

| REFERENCE SYMBOL                      | MOTOROLA PART NO. | DESCRIPTION                           |
|---------------------------------------|-------------------|---------------------------------------|
| R27                                   | 0662057A67        | Chip Res 5600 Ohms                    |
| R28                                   | 0662057A65        | Chip Res 4700 Ohms                    |
| R29                                   | 0662057A85        | Chip Res 33K Ohms                     |
| R30                                   | 0611079G49        | 31.6K, 1/10W; $\pm$ 1%                |
| R31                                   | 0611079G09        | 12.1K, 1/10 W; $\pm$ 1%               |
| R32                                   | 0611079G49        | 31.6K, 1/10W; $\pm$ 1%                |
| R47                                   | 0611079F81        | Chip Res 6.81K 1/10W 1% 0805          |
| R48                                   | 0611079B01        | 12K, $\pm$ 5%; 1/10 W                 |
| R50                                   | 0611079G11        | 12.7K, 1/10W; $\pm$ 1%                |
| R51                                   | 0611079E09        | Resistor: chip 121.0K 1/10 W 1%       |
| R52                                   | 0611079G01        | 10k, $\pm$ 1%; 1/10 W                 |
| R53                                   | 0611079G11        | 12.7K, 1/10W; $\pm$ 1%                |
| R54                                   | 0611079G49        | 31.6K, 1/10W; $\pm$ 1%                |
| R55                                   | 0611079G09        | 12.1K, 1/10 W; $\pm$ 1%               |
| R56                                   | 0611079G17        | Chip Res 14.7K 1/10W 1% 0805          |
| R59                                   | 0662057A97        | Chip Res 100K Ohms                    |
| R61                                   | 0662057A73        | Chip Res 10K Ohms                     |
| R62                                   | 0662057A89        | Chip Res 47K Ohms                     |
| R68                                   | 0685239U03        | RES. PTC 600V .145 HT                 |
| R71                                   | 0611079A01        | O ohms, $\pm$ 5%; 1/10 W              |
| R73                                   | 0611079A01        | O ohms, $\pm$ 5%; 1/10 W              |
| R81                                   | 0611079D58        | Chip Res 392.0 1/10W 1%               |
| R83                                   | 0685239U03        | RES. PTC 600V .145 HT                 |
| R86                                   | 0611079A01        | O ohms, $\pm$ 5%; 1/10 W              |
| R88                                   | 0611079A01        | O ohms, $\pm$ 5%; 1/10 W              |
| R92                                   | 0662057A77        | Chip Res 15K Ohms                     |
| R93                                   | 0662057A57        | Chip Res 2200 Ohms                    |
| R94                                   | 0662057A61        | Chip Res 3300 Ohms                    |
| R98                                   | 0611079E07        | Chip Res 115.0K 1/10W 1%              |
| R99 thru 101                          | 0662057A45        | Chip Res 680 Ohms                     |
| R102                                  | 0662057A73        | Chip Res 10K Ohms                     |
| R105                                  | 0662057A67        | Chip Res 5600 Ohms                    |
| R106                                  | 0662057A75        | Chip Res 12K Ohms                     |
| R107,108                              | 0662057A45        | Chip Res 680 Ohms                     |
| R109                                  | 0611079E07        | Chip Res 115.0K 1/10W 1%              |
| R110,111                              | 0611079E30        | 200K, 1/10 W; $\pm$ 1%                |
| R112,113                              | 0682527W01        | Varistor Silicon Oxide                |
| R115                                  | 0662057A41        | Chip Res 470 Ohms                     |
| R116                                  | 0662057A51        | Chip Res 1200 Ohms                    |
| R117                                  | 0662057A57        | Chip Res 2200 Ohms                    |
| R118,119                              | 0662057A89        | Chip Res 47K Ohms                     |
| R120                                  | 0662057A77        | Chip Res 15K Ohms                     |
| R121                                  | 0662057A73        | Chip Res 10K Ohms                     |
| R122                                  | 0662057A95        | Chip Res 82K Ohms                     |
| R123                                  | 0662057A97        | Chip Res 100K Ohms                    |
| R124                                  | 0662057A81        | Chip Res 22K Ohms                     |
| R125                                  | 0662057A95        | Chip Res 82K Ohms                     |
| R126                                  | 0662057A73        | Chip Res 10K Ohms                     |
| R127                                  | 0662057B06        | Chip Res 220K Ohms                    |
| R128                                  | 0662057A97        | Chip Res 100K Ohms                    |
| R129                                  | 0662057B06        | Chip Res 220K Ohms                    |
| R132                                  | 0662057A89        | Chip Res 47K Ohms                     |
| R133                                  | 0662057A51        | Chip Res 1200 Ohms                    |
| R134                                  | 0662057A81        | Chip Res 22K Ohms                     |
| R135                                  | 0662057A61        | Chip Res 3300 Ohms                    |
| R136                                  | 0662057A45        | Chip Res 680 Ohms                     |
| R138                                  | 0662057B66        | Chip ResChip Res 5.6 Ohms             |
| R139                                  | 0611079G60        | Resistor chip 41.2K 1/10 W 1%         |
| <b>TRANSFORMER:</b>                   |                   |                                       |
| T1,2                                  | 2584422T02        | Transformer Line Matching             |
| <b>SPARK GAP: (SEE NOTE)</b>          |                   |                                       |
| TV1 thru 4                            | 8083379X01        | Surge Suppressor, GLASSBY, 230V       |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b> |                   |                                       |
| U1                                    | 5113819A04        | Quad Operational Amplifier            |
| U2                                    | 5113819A05        | High Performance, Single Supply       |
| U3                                    | 5113819A04        | Quad Operational Amplifier            |
| U4                                    | 5113805A85        | Mux/Demux, Trip 2-Channel Analog      |
| U5                                    | 5113805A86        | Quad Analog Multiplexer/Demultiplexer |
| U6 thru 9                             | 5184742T03        | Optoisolator                          |
| U10                                   | 5184743T01        | CODEC Pulse Code Modulation           |
| U11                                   | 5113805A75        | IC 8 BIT SER TO PAR/PAR HC595         |
| U12                                   | 5113816A07        | 5-Volt Positive Regulator             |
| U13                                   | 5113805A86        | Quad Analog Multiplexer/Demultiplexer |
| <b>VOLTAGE REGULATOR: (SEE NOTE)</b>  |                   |                                       |
| VR1,2                                 | 4813830A18        | Zener, 6.8V                           |
| VR3,4                                 | 4813833C10        | 0.1A, 70 V                            |
| VR5                                   | 4813830A20        | 8.2V $\pm$ 5%; 20 mA 350 mW           |

68P81094E28-C

Parts List (Sheet 7 of 8)

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TTN5067B 4-Wire WIB

| REFERENCE SYMBOL     | MOTOROLA PART NO. | DESCRIPTION                                |
|----------------------|-------------------|--|
| VR6                  | 4813830A18        | Zener, 6.8V                                |
| VR7                  | 4813830A14        | Zener, 5.1 V                               |
| NON-REFERENCED ITEMS |                   |  |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P2)  |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P3)  |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P6)  |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P7)  |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P10) |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P11) |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P18) |
| 0984728L01           |                   | Shorting Jumper: 2-contact (used with P19) |
| 2880001R02           |                   | plug: 2-pin header (used with P2)          |
| 2880001R02           |                   | plug: 2-pin header (used with P3)          |
| 2880001R02           |                   | plug: 2-pin header (used with P6)          |
| 2880001R02           |                   | plug: 2-pin header (used with P7)          |
| 2880001R02           |                   | plug: 2-pin header (used with P18)         |
| 2880001R02           |                   | plug: 2-pin header (used with P19)         |
| 2880001S04           |                   | plug: 8-contact (used with P10)            |
| 2880001S04           |                   | plug: 8-contact (used with P11)            |
| 5482006W01           |                   | Label, PCB barcode                         |
| 5482006W02           |                   | ribbon, thermal transfer                   |
| 5484960T01           |                   | Label, barcode: 6.3 x 12.7mm, white        |
| 5484960T02           |                   | Label Blank Barcode                        |

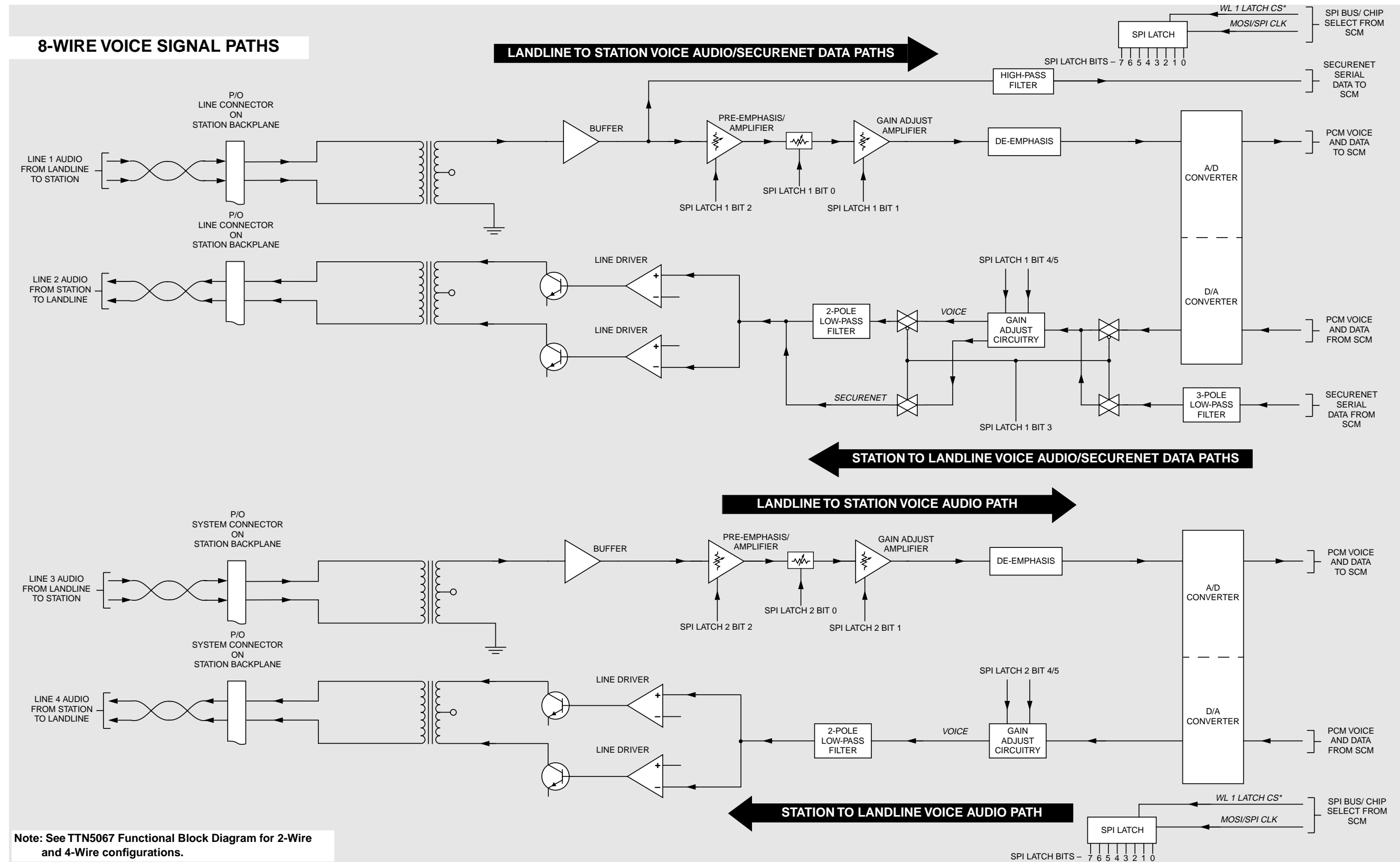
**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

TTN5067B 4-Wire WIB

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION |
|------------------|-------------------|-------------|
|------------------|-------------------|-------------|

# 8-WIRE WIB MODULE

## MODEL TTN5068A



### TTN5068A 8-WIRE VOICE AUDIO DATA PATH FUNCTIONAL BLOCK DIAGRAM



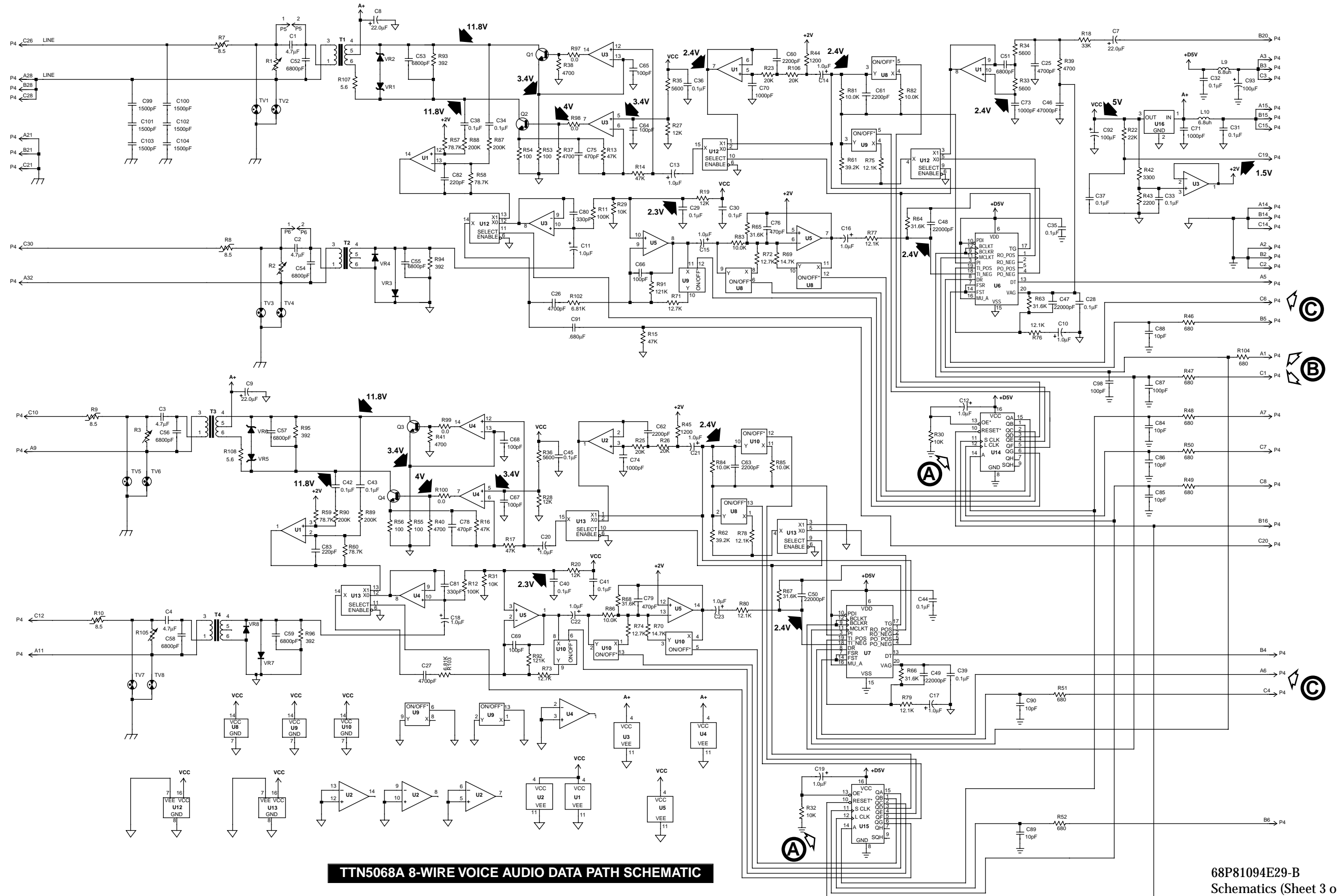
8-WIRE WIB MODULE

MODEL TTN5068A

| Signal Path | Description/Nominal Signal Levels  |
|-------------|--|
| Ⓐ           | The SPI LATCHes U14 and U15 are used to configure the WIB by means of several MUXs and Analog switches.<br>The output pins 1 to 6 and pin 15 drive the select inputs of the configuration path switches and amplification step switches. |
| Ⓑ           | The continuous Master Clock and the Bit Clock are essential for the correct data transfer and data sampling.<br>Both are square waves with the duty cycle 1:1 with a period of 3.9 μsec.   |
| Ⓒ           | The continuous Frame Sync Clock starts the PCM serial Block Transfer<br>The waveform is a needle pulse train with a repetition rate of 125 μsec.   |

# 8-WIRE WIB MODULE

## MODEL TTN5068A

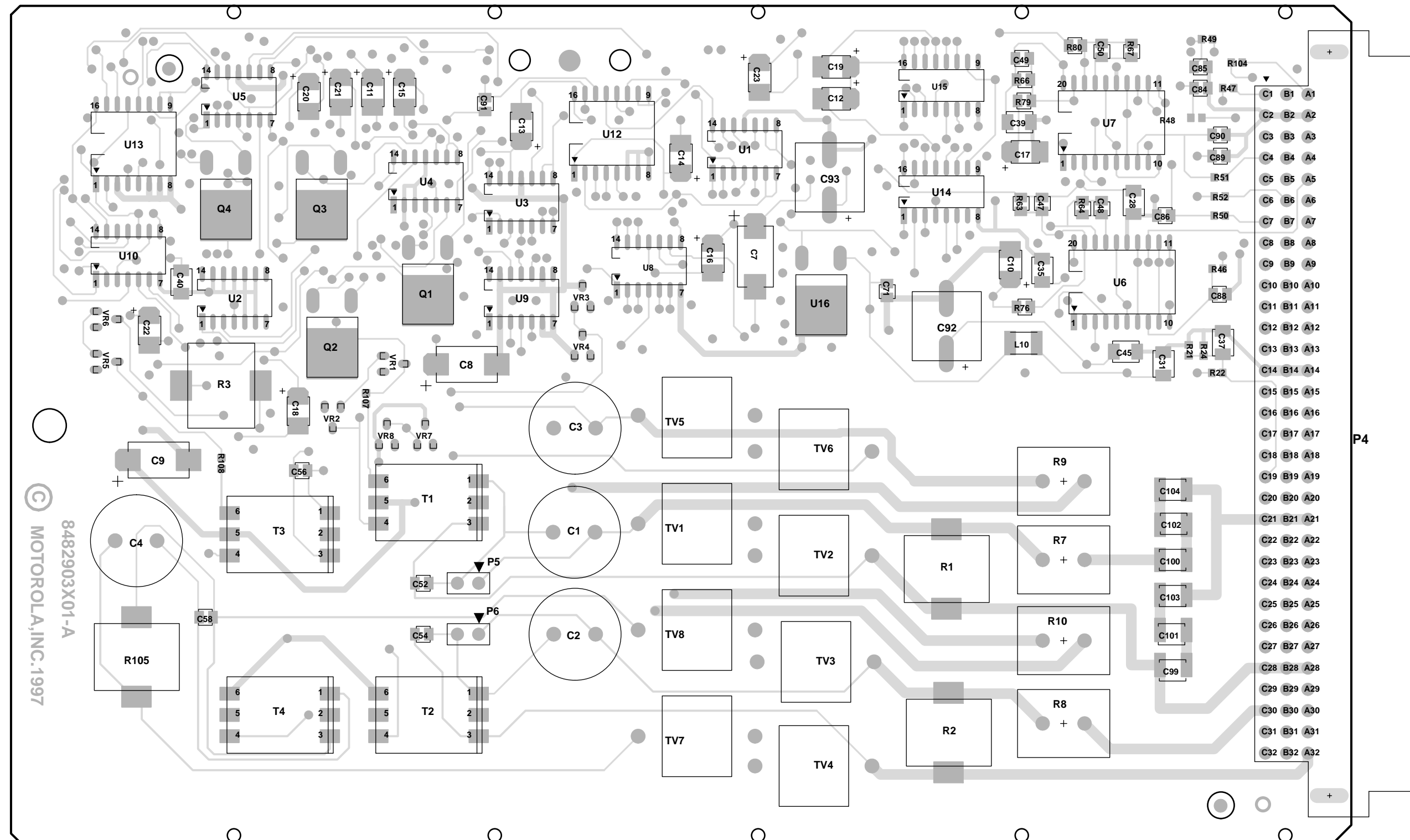


**8-WIRE WIB MODULE**  
**MODEL TTN5068A**

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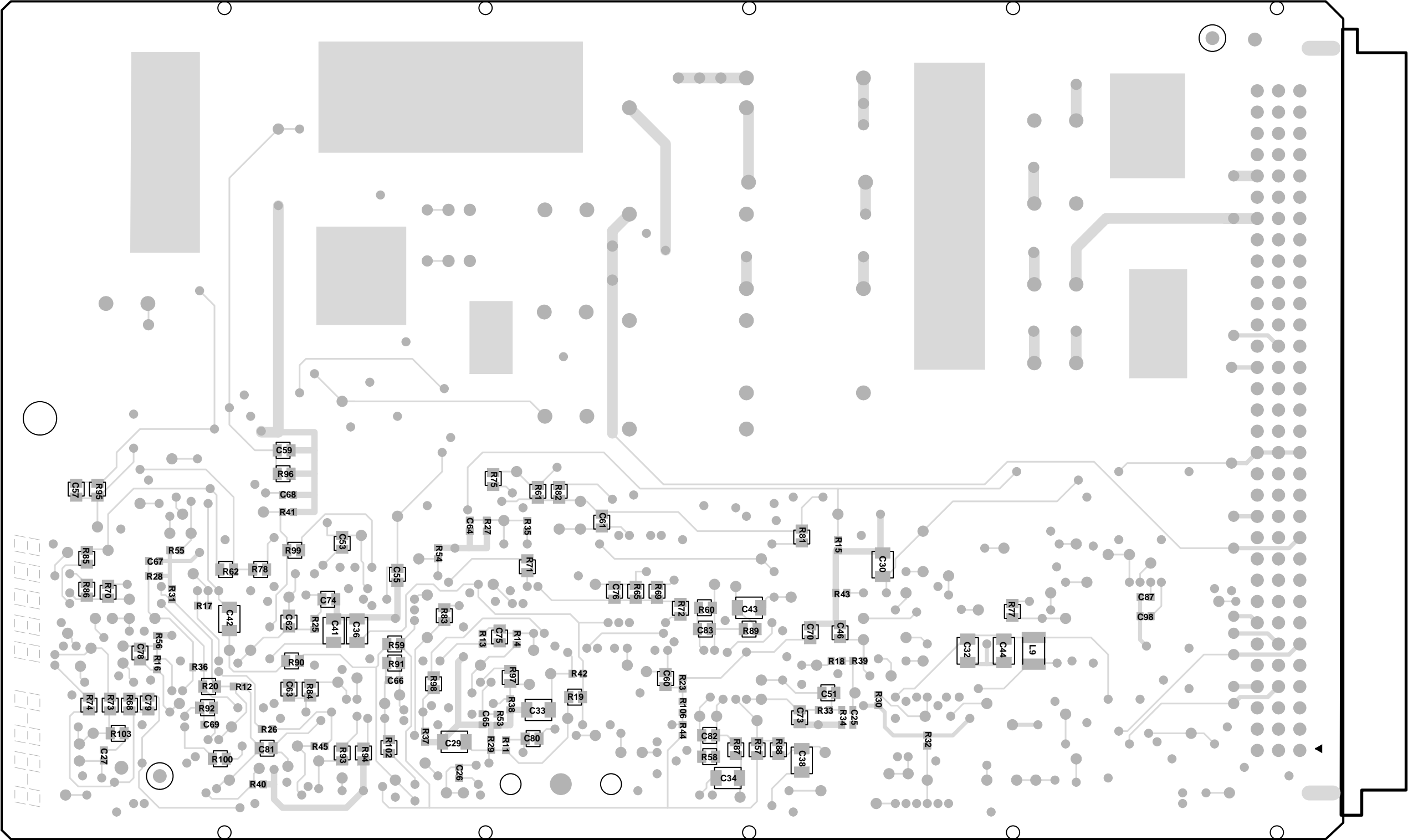
# 8-WIRE WIB MODULE

## MODEL TTN5068A



TTN5068A 8-WIRE VOICE AUDIO DATA BOARD DETAIL  
HEAVY COMPONENT SIDE

8-WIRE WIB MODULE  
MODEL TTN5068A



TTN5068A 8-WIRE VOICE AUDIO DATA BOARD DETAIL  
LIGHT COMPONENT SIDE

# Parts List

## TTN5068A 8-Wire WIB

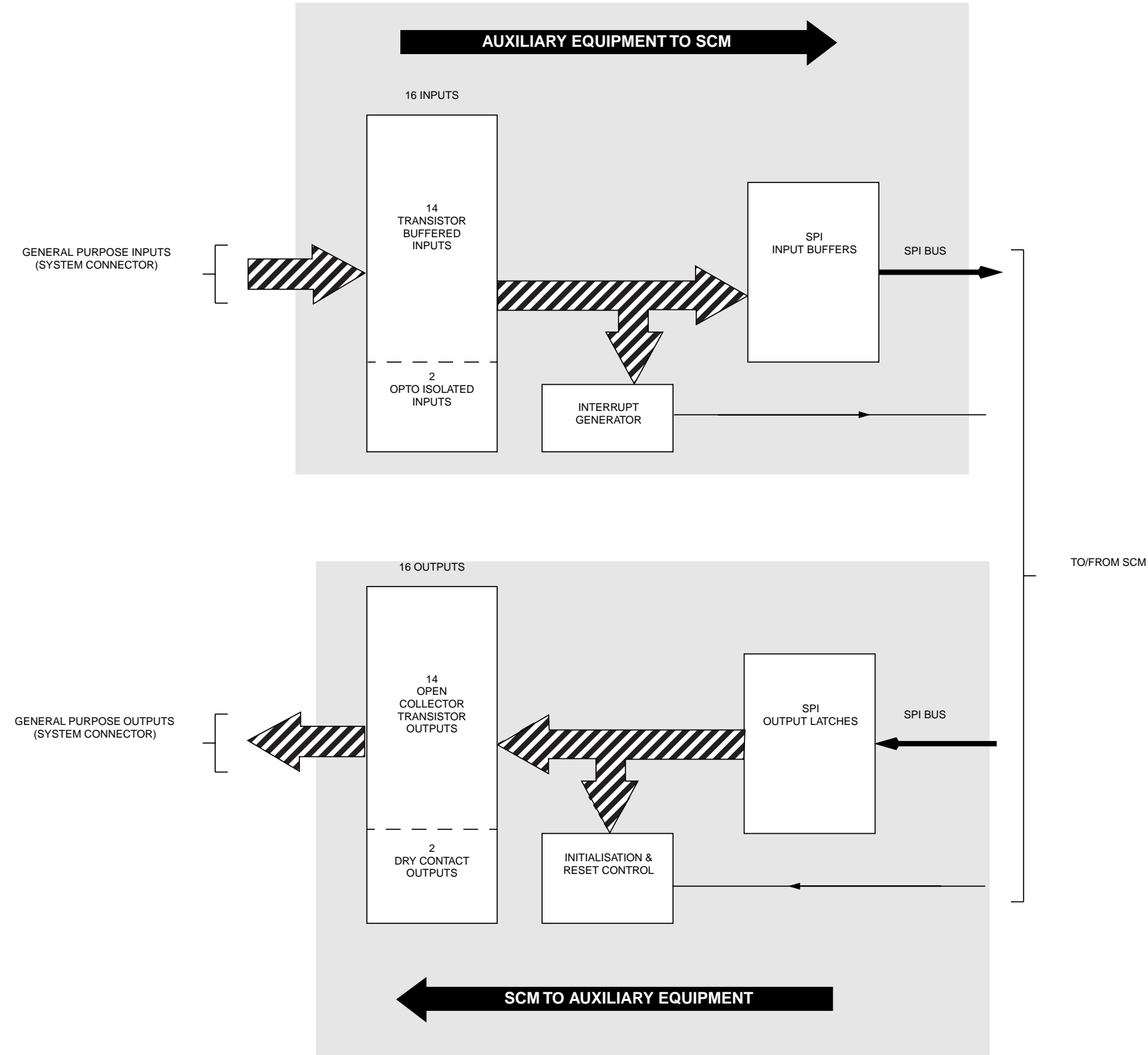
| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION                            |
|---|-------------------|--|
| <b>CAPACITOR, FIXED: <math>\mu\text{F}</math> <math>\pm 10\%</math>; 100 V:</b> |                   |  |
| UNLESS OTHERWISE STATED   |                   |  |
| C1 thru 4   | 2382174V01        | 4.7 $\mu\text{F}$ , $\pm 20\%$ ; 200 V |
| C7 thru 9   | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V   |
| C10 thru 23   | 2311049A08        | 1 $\mu\text{F}$ , $\pm 10\%$ ; 35 V    |
| C25 thru 27   | 2113741F41        | 4700 pF, $\pm 5\%$ ; 50V               |
| C28 thru 45   | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V   |
| C46   | 2113741A61        | 0.047 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C47 thru 50   | 2113741A53        | 0.022 $\mu\text{F}$ , $\pm 5\%$ ; 50 V |
| C51 thru 59   | 2113741A41        | 6800 pF, $\pm 5\%$ ; 50 V              |
| C60 thru 63   | 2113741A29        | 2200 pF, $\pm 5\%$ ; 50 V              |
| C64 thru 69   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C70,71  | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C73,74  | 2113740A79        | 1000 pF, $\pm 5\%$ ; 50 V              |
| C75,76  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C78,79  | 2113740A71        | 470 pF, $\pm 5\%$ ; 50 V               |
| C80,81  | 2113740A67        | 330 pF, $\pm 5\%$ ; 50 V               |
| C82,83  | 2113740A63        | 220 pF, $\pm 5\%$ ; 50 V               |
| C84 thru 86   | 2113740A29        | 10 pF, $\pm 5\%$ ; 50 V                |
| C87   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C88 thru 90   | 2113740A29        | 10 pF, $\pm 5\%$ ; 50 V                |
| C91   | 2113743F15        | Cap Chip.680 $\mu\text{F}$ 16V +80-20% |
| C92,93  | 2380090M36        | Cap 100 $\mu\text{F}$ 25V              |
| C98   | 2113740F51        | 100 pF, $\pm 5\%$ ; 50V                |
| C99 thru 104  | 2113918A11        | Cap Chip 1500pF 1000V 20% X7R          |
| <b>COIL, INDUCTOR:</b>  |                   |  |
| L9,10   | 2411087B36        | 6.8 $\mu\text{H}$                      |
| <b>CONNECTOR, PLUG:</b>   |                   |  |
| P4  | 2883562R04        | PLUG, EUROCARD 96 PIN R A              |
| P5,6  | 2880001R02        | plug: 2-pin header                     |
| <b>TRANSISTOR: (SEE NOTE)</b>   |                   |  |
| Q1 thru 4   | 4813822A07        | NPN                                    |
| <b>RESISTOR, FIXED: <math>\pm 5\%</math>; 1/16 W:</b>                           |                   |  |
| UNLESS OTHERWISE STATED:  |                   |  |
| R1 thru 3   | 0682527W01        | Varistor Silicon Oxide                 |
| R7 thru 10  | 0685239U03        | Resistor PTC 600V.145 HT               |
| R11,12  | 0662057A97        | Chip Res 100K Ohms                     |
| R13 thru 17   | 0662057A89        | Chip Res 47K Ohms                      |
| R18   | 0662057A85        | Chip Res 33K Ohms                      |
| R19,20  | 0611079B01        | 12K, $\pm 5\%$ ; 1/10 W                |
| R22   | 0662057A81        | Chip Res 22K Ohms                      |
| R23   | 0662057A80        | Chip Res 20K Ohms                      |
| R25,26  | 0662057A80        | Chip Res 20K Ohms                      |
| R27,28  | 0662057A75        | Chip Res 12K Ohms                      |
| R29 thru 32   | 0662057A73        | Chip Res 10K Ohms                      |
| R33 thru 36   | 0662057A67        | Chip Res 5600 Ohms                     |
| R37 thru 41   | 0662057A65        | Chip Res 4700 Ohms                     |
| R42   | 0662057A61        | Chip Res 3300 Ohms                     |
| R43   | 0662057A57        | Chip Res 2200 Ohms                     |
| R44,45  | 0662057A51        | Chip Res 1200 Ohms                     |
| R46 thru 52   | 0662057A45        | Chip Res 680 Ohms                      |
| R53 thru 56   | 0662057A25        | Chip Res 100 Ohms                      |
| R57 thru 60   | 0611079G87        | Resistor chip 78.7K 1/10 W 1%          |
| R61,62  | 0611079G58        | Resistor chip 39.2K 1/10 W 1%          |
| R63 thru 68   | 0611079G49        | 31.6K, 1/10W; $\pm 1\%$                |
| R69,70  | 0611079G17        | Chip Res 14.7K 1/10W 1% 0805           |
| R71 thru 74   | 0611079G11        | 12.7K, 1/10W; $\pm 1\%$                |
| R75 thru 80   | 0611079G09        | 12.1K, 1/10 W; $\pm 1\%$               |
| R81 thru 86   | 0611079G01        | 10k, $\pm 1\%$ ; 1/10 W                |
| R87 thru 90   | 0611079E30        | 200K, 1/10 W; $\pm 1\%$                |
| R91,92  | 0611079E09        | Resistor: chip 121.0K 1/10 W 1%        |
| R93 thru 96   | 0611079D58        | Chip Res 392.0 1/10W 1%                |
| R97 thru 100  | 0611079A01        | O ohms, $\pm 5\%$ ; 1/10 W             |
| R102,103  | 0611079F81        | Chip Res 6.81K 1/10W 1% 0805           |
| R104  | 0662057A45        | Chip Res 680 Ohms                      |
| R105  | 0682527W01        | Varistor Silicon Oxide                 |
| R106  | 0662057A80        | Chip Res 20K Ohms                      |
| R107,108  | 0662057B66        | Chip Res 5.6 Ohms                      |
| <b>TRANSFORMER:</b>   |                   |  |
| T1 thru 4   | 2584422T02        | Transformer Line Matching              |
| <b>SPARK GAP: (SEE NOTE)</b>  |                   |  |
| TV1 thru 8  | 8083379X01        | Surge Suppressor, GLASSBY, 230V        |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b>   |                   |  |
| U1,2  | 5113819A05        | High Performance, Single Supply        |

## TTN5068A 8-Wire WIB

| REFERENCE SYMBOL                     | MOTOROLA PART NO. | DESCRIPTION                           |
|--------------------------------------|-------------------|---------------------------------------|
| U3 thru 5                            | 5113819A04        | Quad Operational Amplifier            |
| U6,7                                 | 5184743T01        | CODEC Pulse Code Modulation           |
| U8 thru 10                           | 5113805A86        | Quad Analog Multiplexer/Demultiplexer |
| U12,13                               | 5113805A85        | Mux/Demux, Trip 2-Channel Analog      |
| U14,15                               | 5113805A75        | IC 8 BIT SER TO PAR/PAR HC595         |
| U16                                  | 5113816A07        | 5-Volt Positive Regulator             |
| <b>VOLTAGE REGULATOR: (SEE NOTE)</b> |                   |                                       |
| VR1,2                                | 4813830A18        | Zener, 6.8V                           |
| VR3,4                                | 4813833C10        | 0.1A, 70 V                            |
| VR5,6                                | 4813830A18        | Zener, 6.8V                           |
| VR7,8                                | 4813833C10        | 0.1A, 70 V                            |
| <b>NON-REFERENCED ITEMS</b>          |                   |                                       |
|                                      | 0984728L01        | Shorting Jumper: 2-contact (2 used)   |
|                                      | 5482006W01        | Label, PCB barcode                    |
|                                      | 5482006W02        | ribbon, thermal transfer              |
|                                      | 5484960T02        | Label Blank Barcode                   |

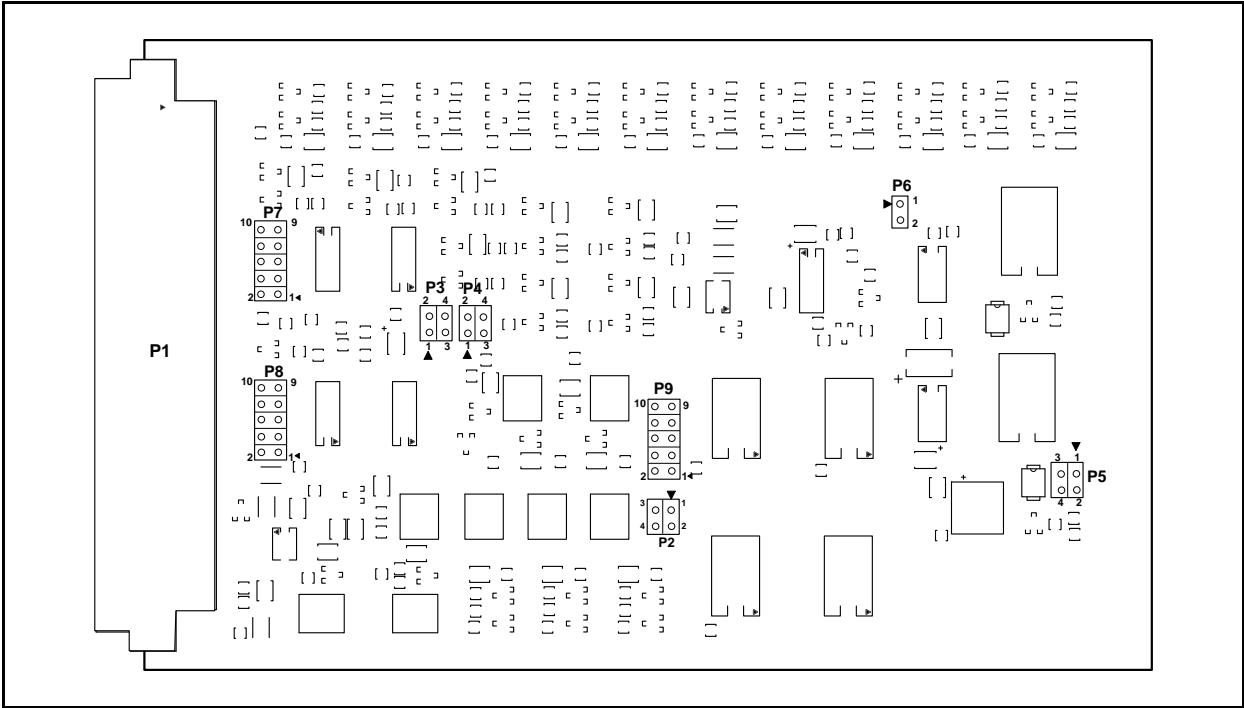
**Note:** For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

**AUXILIARY I/O MODULE**  
**MODEL CLN6698B**



**AUXILIARY I/O FUNCTIONAL BLOCK DIAGRAM**

AUXILIARY I/O MODULE  
MODEL CLN6698B



AUXILIARY I/O BOARD JUMPERS

Jumpers are provided to route inputs and outputs in a specific direction to and from the SCM; the SCM determines the functionality of the inputs and outputs.

The board jumpers are shown in the figure above.

GPI\_14 is a special input which can be jumpered to be a transistor input or opto isolated.

In addition it can be dedicated to the Ext\_PTT\* Line routed to the SCM. This function is a fast external PTT\* (an active low function).

The board jumper settings for P2, P9, P6 are provided in Table 1. Settings for P5 are provided in Table 2. Settings for P3, P4 are provided in Table 3.

The five optional jumper position of P7 are used for additional connection of General Purpose Outputs if all General Purpose Inputs are not in use. Table 4 shows the jumper settings provided by P7. P8 is not used.

Table 1. Configuring Input GPI\_14 Function

| Function on GPI_14 | Input Type                              | System Connector Input Pins | Auxiliary I/O Board Jumpers |               |                    |
|--------------------|---|-----------------------------|-----------------------------|---------------|--------------------|
|                    |   |                             | P2                          | P9            | P6<br>(See Note 1) |
| Fast External PTT* | via Optocoupler (E/M sub). (See Note 2) | A29 Opto +<br>A26 Opto –    | 3 - 4, 1 - 2                |               | In                 |
|                    | via Transistor                          | B26                         |                             | 9 - 10, 7 - 8 | In                 |
| Fast External PTT  | via Optocoupler (E/M sub)               | A29 Opto +<br>A26 Opto –    | 3 - 4, 1 - 2                |               | Out                |
|                    | via Transistor                          | B26                         |                             | 9 - 10, 7 - 8 | Out                |

Table 2. Configuring Output GPO\_14 Function

| Function on GPO_14                      | Output Type       | System Connector Output Pins | Auxiliary I/O Board Jumper P5 |
|---|-------------------|------------------------------|-------------------------------|
| AC Fail                                 | via Relay Closure | B29, A30                     | 2 - 4                         |
| SPI Latch for GPO_14 (software defined) | via Relay Closure | B29, A30                     | 1 - 2                         |

Table 3. Configuring Output GPO\_15 Function

| Function on GPO_15                      | Output Type                    | System Connector Output Pins | Auxiliary I/O Board Jumpers |       |
|---|--------------------------------|------------------------------|-----------------------------|-------|
|   |                                |                              | P3                          | P4    |
| Fast Carrier Detect                     | via Relay Closure              | C3, B3                       | 2 - 4                       | 2 - 4 |
|   | via Open Collector             | B21 (see Note 4)             | 3 - 4                       | 2 - 4 |
| RdStat                                  | via Relay Closure (see Note 3) | C3, B3                       | 2 - 4                       | 1 - 3 |
|   | via Open Collector             | B21 (see Note 4)             | 3, 4                        | 1, 3  |
| SPI Latch for GPO_15 (software defined) | via Relay Closure              | C3, B3                       | 1 - 2                       |       |
|   | via Open Collector             | B21 (see Note 4)             | 1 - 3                       |       |

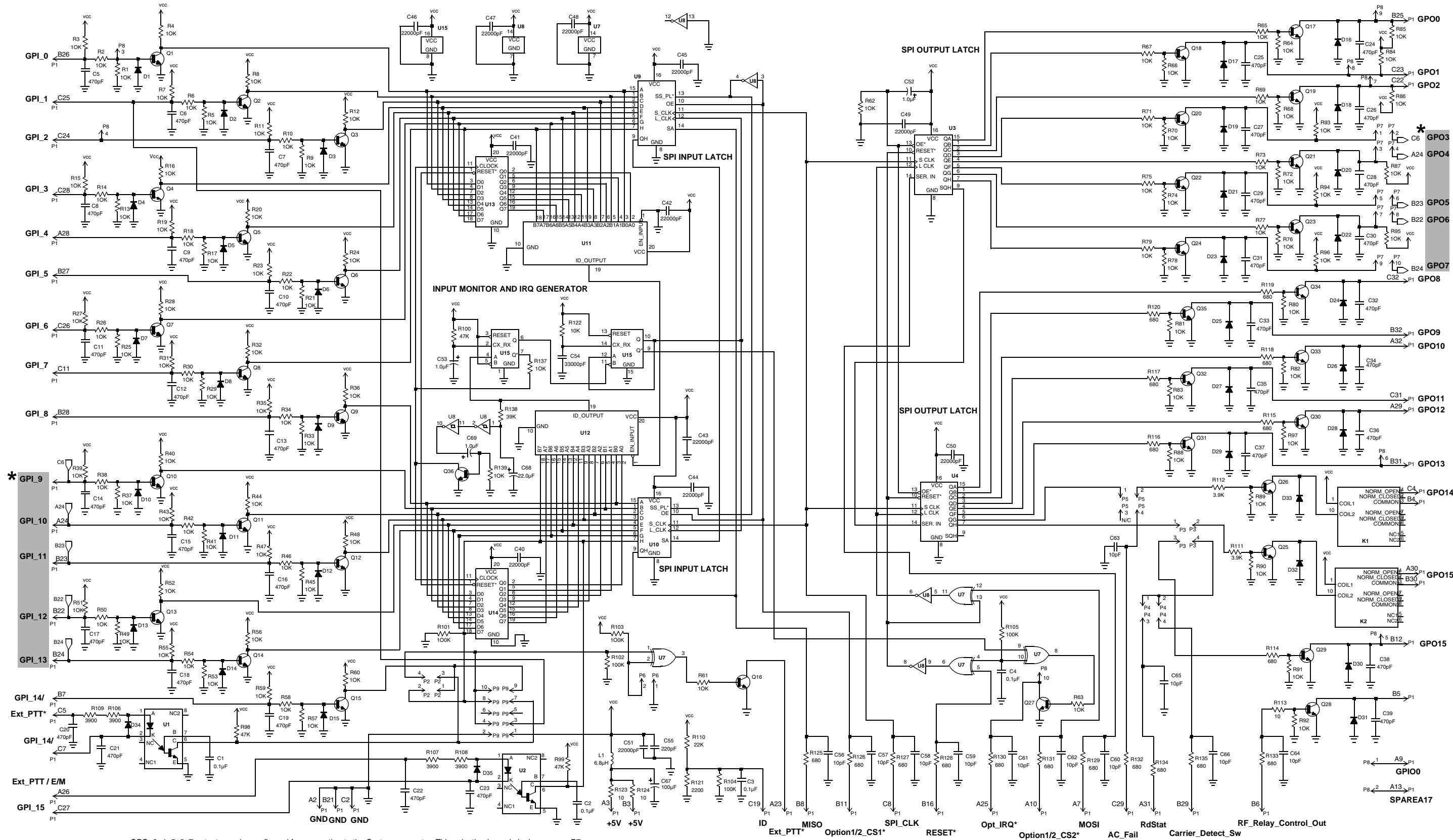
Table 4. Configuring Additional GPOs

| Configured GPO Assignment | GPI Assignment | System Connector Pin | Auxiliary I/O Board Jumper P7 |
|---------------------------|----------------|----------------------|-------------------------------|
| GPO_3                     | GIP_9          | A28                  | 1 - 2                         |
| GPO_4                     | GPI_10         | C12                  | 3 - 4                         |
| GPO_5                     | GPI_11         | B12                  | 5 - 6                         |
| GPO_6                     | GPI_12         | B11                  | 7 - 8                         |
| GPO_7                     | GPI_13         | B9                   | 9 - 10                        |



# AUXILIARY I/O MODULE

## MODEL CLN6698B



- \* GPI\_3, 4, 5, 6, 7 outputs can be configured for connection to the System connector. This selection is made by jumpers on P7. These GPOs can be used if more than 11 GPOs are required. Care must be taken since these pins (at the System connector) can alternatively be used as Inputs (GPI\_9 to GPI\_13). As a result, it is possible to configure these System connector pins as outputs and connect these to auxiliary equipment outputs. Consequently, damage might occur. Ensure that only the appropriate connection (i.e., input or output) will be made at the System connector before jumper P7 is set to enable the GPO. The factory default jumper settings for P7 configure the Auxiliary I/O board for 16 inputs and 11 outputs; that is, there are no jumpers set on P7.



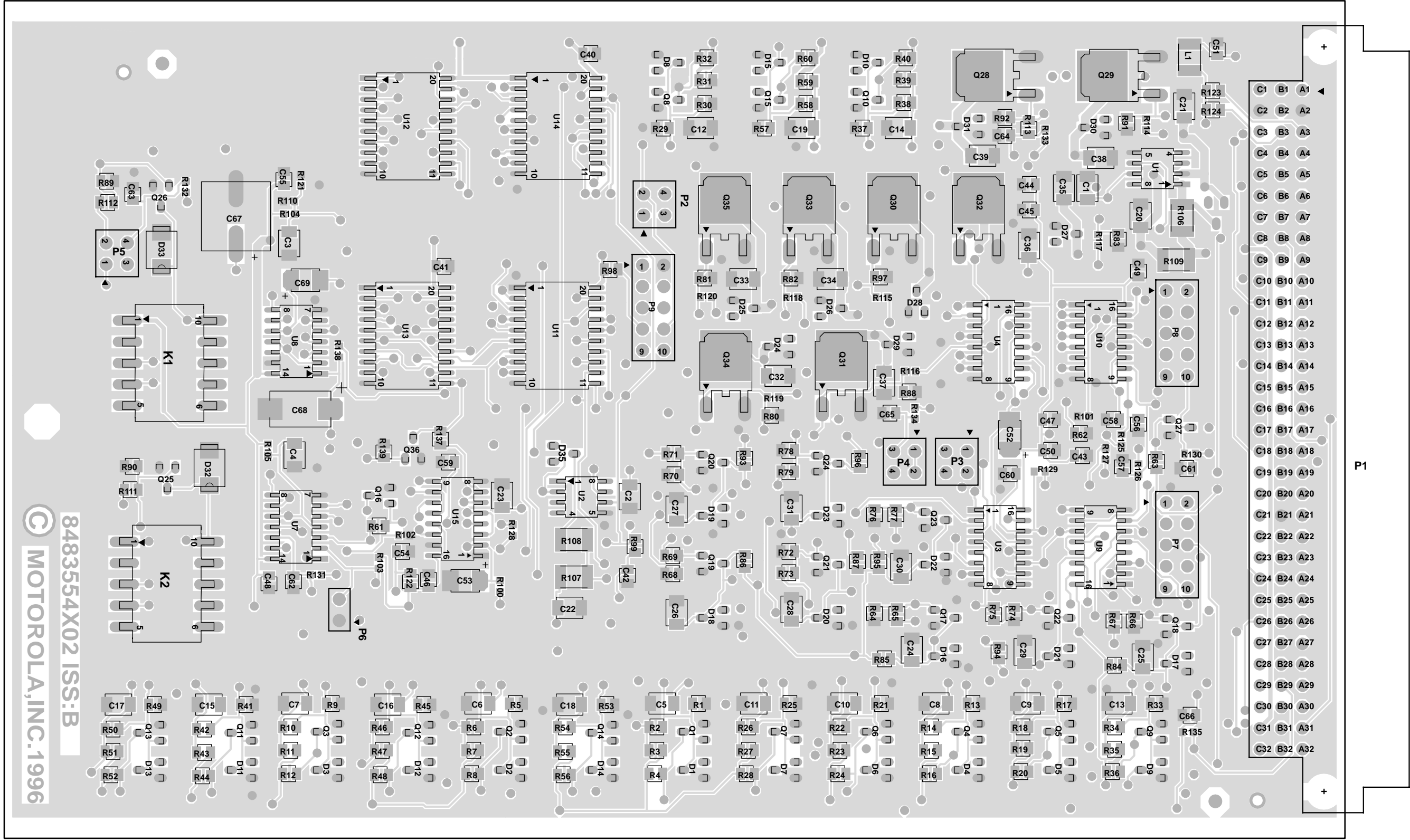
CLN6698B AUXILIARY I/O BOARD SCHEMATIC

68P81094E74-C  
Schematics (Sheet 3 of 7)  
03/26/99

**AUXILIARY I/O MODULE**  
**MODEL CLN6698B**

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AUXILIARY I/O MODULE  
MODEL CLN6698B



CLN6698B AUXILIARY I/O BOARD DETAIL-TOP

AUXILIARY I/O MODULE  
MODEL CLN6698B



CLN6698B AUXILIARY I/O BOARD DETAIL-BOTTOM

# Parts List

## CLN6698B AUXILIARY I/O BOARD

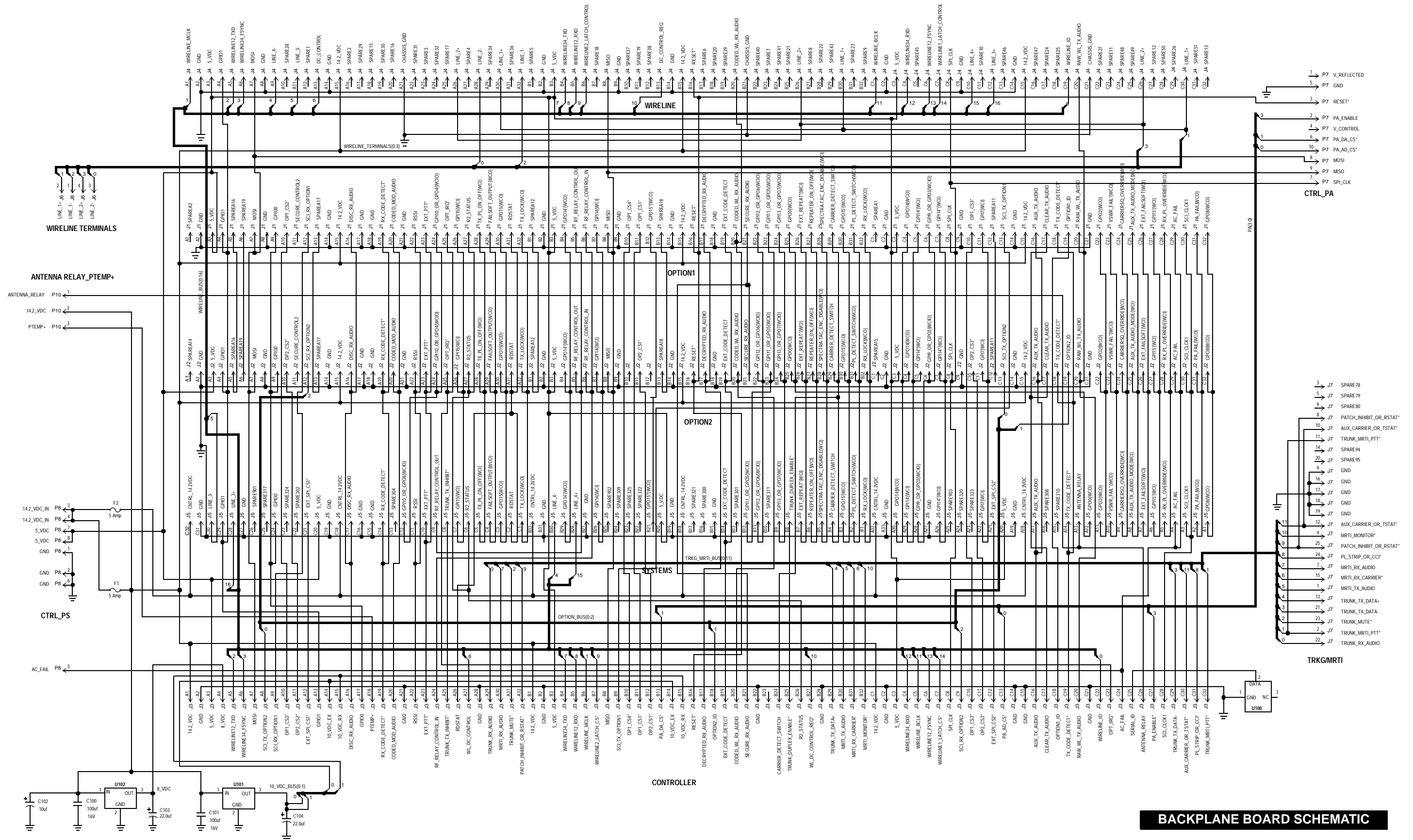
| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION                                   |
|---|-------------------|---|
| <b>CAPACITOR, FIXED: <math>\mu\text{F}</math> <math>\pm 10\%</math>; 100 V:</b> |                   |   |
| UNLESS OTHERWISE STATED   |                   |   |
| C1 thru 4   | 2113741B69        | 0.1 $\mu\text{F}$ , $\pm 5\%$ ; 50 V          |
| C5 thru 39  | 2113918A05        | 470 pF, $\pm 20\%$ ; 1000 V                   |
| C40 thru 51   | 2113741A53        | 0.022 $\mu\text{F}$ , $\pm 5\%$ ; 50 V        |
| C52,53  | 2311049A08        | 1 $\mu\text{F}$ , $\pm 10\%$ ; 35 V           |
| C54   | 2113741A57        | 0.033 $\mu\text{F}$ , $\pm 5\%$ ; 50 V        |
| C55   | 2113740A63        | 220 pF, $\pm 5\%$ ; 50 V                      |
| C56 thru 66   | 2113740A29        | 10 pF, $\pm 5\%$ ; 50 V                       |
| C67   | 2380090M36        | CAP 100 UF 25V                                |
| C68   | 2311049A21        | 22 $\mu\text{F}$ , $\pm 10\%$ ; 20 V          |
| C69   | 2311049A08        | 1 $\mu\text{F}$ , $\pm 10\%$ ; 35 V           |
| <b>DIODE: (SEE NOTE)</b>  |                   |   |
| D1 thru 31  | 4813833C10        | 0.1A, 70 V                                    |
| D32,33  | 4813833B01        | Schottky type                                 |
| D34,35  | 4813833C10        | 0.1A, 70 V                                    |
| <b>RELAY:</b>   |                   |   |
| K1,2  | 8013917B01        | 5 V, 330 Ohm                                  |
| <b>COIL, INDUCTOR:</b>  |                   |   |
| L1  | 2411087B36        | 6.8 $\mu\text{H}$                             |
| <b>CONNECTOR, PLUG:</b>   |                   |   |
| P1  | 2883562R04        | Plug, Eurocard 96 PIN R A                     |
| P7 thru 9   | 2880001S05        | plug: 10-contact                              |
| <b>TRANSISTOR: (SEE NOTE)</b>   |                   |   |
| Q1 thru 27  | 4813824A11        | NPN   |
| Q28 thru 35   | 4813822A07        | NPN   |
| Q36   | 4813824A11        | NPN   |
| <b>RESISTOR, FIXED: <math>\pm 5\%</math>; 1/16 W:</b>                           |                   |   |
| UNLESS OTHERWISE STATED   |                   |   |
| R1 thru 97  | 0611079A98        | 10K, 1/10 W                                   |
| R98,99  | 0611079A94        | 6800 Ohms, 1/10 W                             |
| R100  | 0662057A89        | Chip Res 47K Ohms                             |
| R101 thru 105   | 0662057A97        | Chip Res 100K Ohms                            |
| R106 thru 109   | 0611072A63        | 3900 Ohms, 1/4W                               |
| R110  | 0662057A81        | Chip Res 22K Ohms                             |
| R111,112  | 0611079A88        | 3900 Ohms, 1/10 W                             |
| R113  | 0611079A26        | 10 Ohms, 1/10 W                               |
| R114 thru 120   | 0662057A45        | Chip Res 680 Ohms                             |
| R121  | 0662057A57        | Chip Res 2200 Ohms                            |
| R122  | 0611079A98        | 10K, 1/10 W                                   |
| R123,124  | 0611079A26        | 10 Ohms, 1/10 W                               |
| R125 thru 135   | 0662057A45        | Chip Res 680 Ohms                             |
| R137  | 0611079A98        | 10K, 1/10 W                                   |
| R138  | 0662057A87        | Chip Res 39K Ohms                             |
| R139  | 0611079A98        | 10K Ohms, 1/10 W                              |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b>   |                   |   |
| U1,2  | 5184742T01        | Optoisolator                                  |
| U3,4  | 5113805A75        | IC 8 BIT SER TO PAR/PAR HC595                 |
| U7  | 5113805A22        | Quad 2-Input Exclusive OR Gate                |
| U8  | 5113805A09        | Schmit Trigger Hex Inverter                   |
| U9,10   | 5113805A74        | IC; 8-bit register                            |
| U11,12  | 5113807A37        | IC OCTAL Comparator                           |
| U13,14  | 5113805A60        | Octal D, Flip-Flop                            |
| U15   | 5113805A89        | Monostable Multivibrator, Dual Precision      |
| <b>NON-REFERENCED ITEMS</b>   |                   |   |
| 0984728L01  |                   | Shorting Jumper: 2-contact (2 used with P2)   |
| 0984728L01  |                   | Shorting Jumper: 2-contact (used with P3)     |
| 0984728L01  |                   | Shorting Jumper: 2-contact (used with P4)     |
| 0984728L01  |                   | Shorting Jumper: 2-contact (used with P5)     |
| 0984728L01  |                   | Shorting Jumper: 2-contact (used with P6)     |
| 2880001R02  |                   | plug: 2-pin header (used with P6)             |
| 2880001S02  |                   | CON PCB HDR 1 GOLD DR ST 4 POS (used with P2) |
| 2880001S02  |                   | CON PCB HDR 1 GOLD DR ST 4 POS (used with P3) |
| 2880001S02  |                   | CON PCB HDR 1 GOLD DR ST 4 POS (used with P4) |
| 2880001S02  |                   | CON PCB HDR 1 GOLD DR ST 4 POS (used with P5) |
| 5482006W01  |                   | Label, PCB barcode                            |
| 5482006W02  |                   | Ribbon, thermal transfer                      |
| 5484960T02  |                   | Label Blank Barcode                           |

## CLN6698B AUXILIARY I/O BOARD

| REFERENCE SYMBOL  | MOTOROLA PART NO. | DESCRIPTION |
|---|-------------------|-------------|
| <b>Note:</b> For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number. |                   |             |

# STATION BACKPLANE MODULE

## MODEL TTN5062B



**STATION BACKPLANE MODULE**  
**MODEL TTN5062B**

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STATION BACKPLANE MODULE  
MODEL TTN5062B

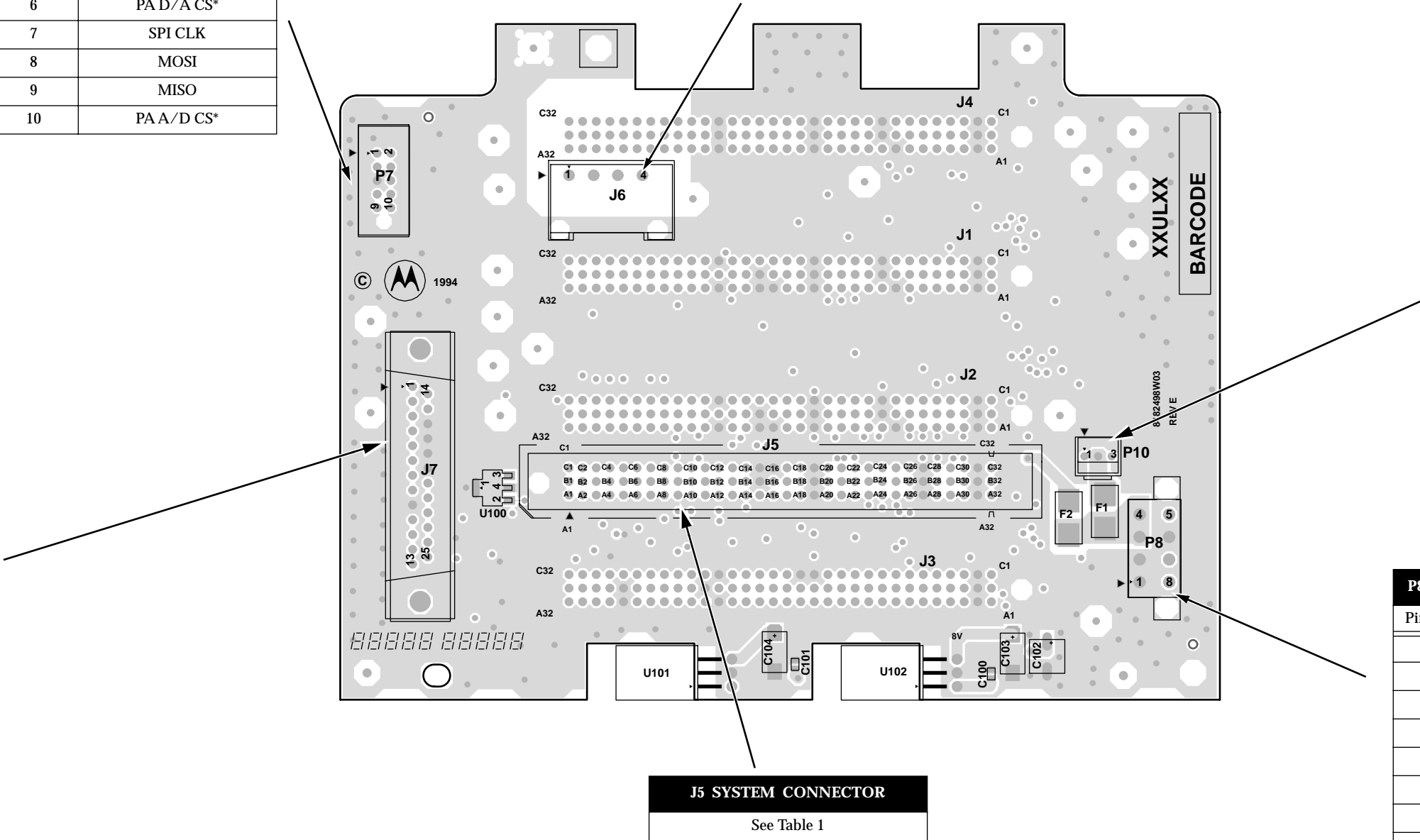
| P7 PA CONTROL CONNECTOR |                 |
|-------------------------|-----------------|
| Pin No.                 | Signal          |
| 1                       | Voltage Forward |
| 2                       | PA Enable*      |
| 3                       | PA Reset        |
| 4                       | V Control       |
| 5                       | GND             |
| 6                       | PA D/A CS*      |
| 7                       | SPI CLK         |
| 8                       | MOSI            |
| 9                       | MISO            |
| 10                      | PA A/D CS*      |

| J6 WIRELINE TERMINALS |         |
|-----------------------|---------|
| Pin No.               | Signal  |
| 1                     | Line 1- |
| 2                     | Line 1+ |
| 3                     | Line 2- |
| 4                     | Line 2+ |

| J7 TRUNKING/MRTI CONNECTOR |                         |
|----------------------------|-------------------------|
| Pin No.                    | Signal                  |
| 1                          | MRTI TX Audio           |
| 2                          | Trunk MRTI PTT*         |
| 3                          | Spare                   |
| 4                          | MRTI Monitor*           |
| 5                          | Spare                   |
| 6                          | Spare                   |
| 7                          | MRTI RX Audio           |
| 8                          | Patch Inhibit* or RSTAT |
| 9                          | GND                     |
| 10                         | Aux Carrier* or TSTAT   |
| 11                         | Trunk MRTI PTT*         |
| 12                         | Aux Carrier* or TSTAT   |
| 13                         | Trunk TX Data+          |
| 14                         | Spare                   |
| 15                         | MRTI RX Carrier*        |
| 16                         | GND                     |
| 17                         | GND                     |
| 18                         | GND                     |
| 19                         | GND                     |
| 20                         | Spare                   |
| 21                         | Trunk TX Data-          |
| 22                         | Trunk RX Audio          |
| 23                         | Trunk Mute*             |
| 24                         | PL Strip* or CCI*       |
| 25                         | Patch Inhibit* or RSTAT |

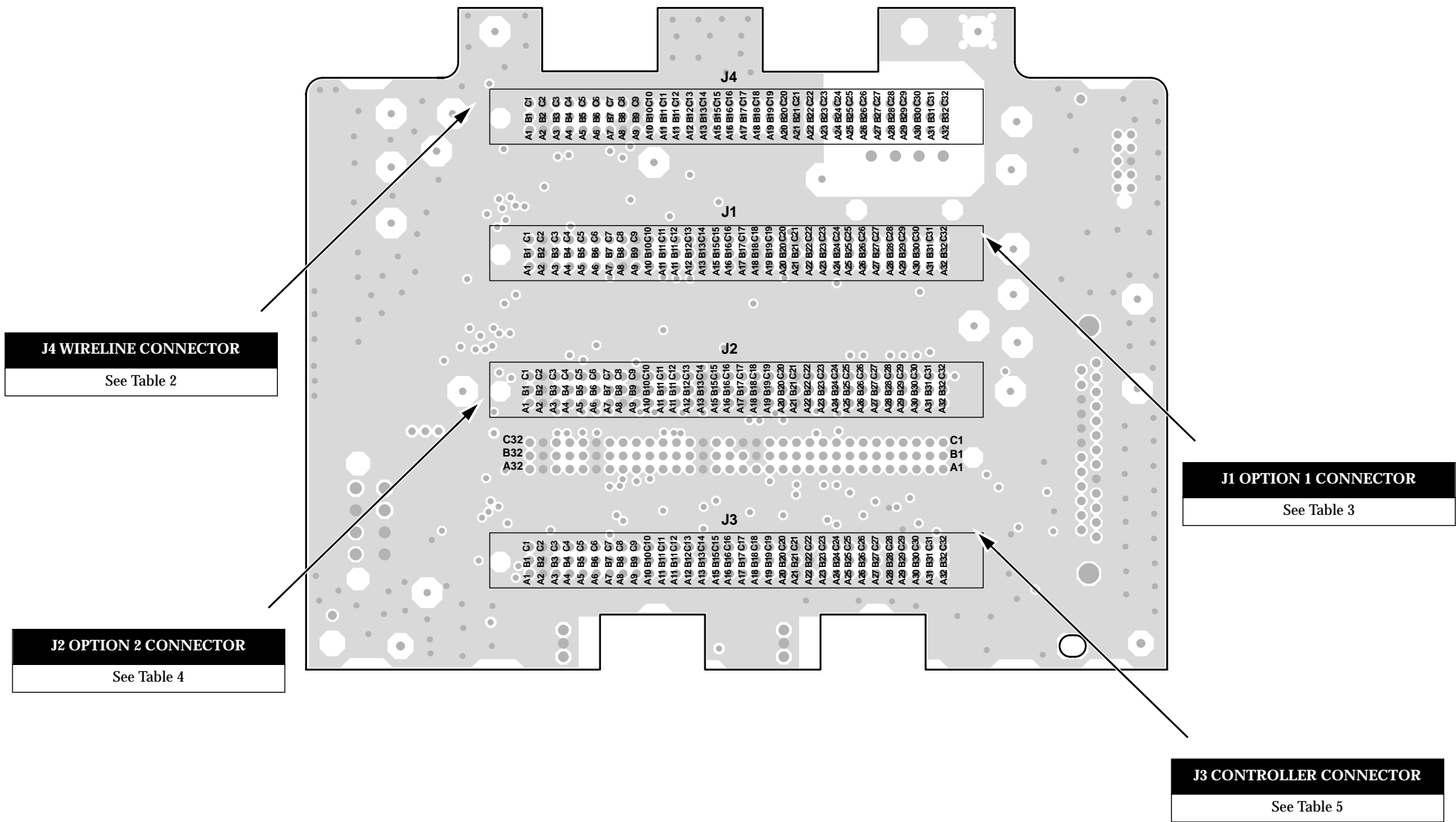
| P10 ANTENNA RELAY / PTEMP+ CONNECTOR |               |
|--------------------------------------|---------------|
| Pin No.                              | Signal        |
| 1                                    | Antenna Relay |
| 2                                    | 14.2 VDC      |
| 3                                    | PTemp+        |

| P8 POWER SUPPLY CONNECTOR |          |
|---------------------------|----------|
| Pin No.                   | Signal   |
| 1                         | GND      |
| 2                         | GND      |
| 3                         | 14.2 VDC |
| 4                         | 14.2 VDC |
| 5                         | AC Fail  |
| 6                         | GND      |
| 7                         | 5 VDC    |
| 8                         | 5 VDC    |





STATION BACKPLANE MODULE  
MODEL TTN5062B



BACKPLANE BOARD DETAIL INSIDE VIEW

STATION BACKPLANE MODULE MODEL TTN5062B

| Table 1. J5 SYSTEM CONNECTOR  |                               |  |                              |  |                            |   |                        |   |                                 |   |                        |   |
|---|-------------------------------|--|------------------------------|--|----------------------------|---|------------------------|---|---------------------------------|---|------------------------|---|
| Pin #   | Row A                         | Input/<br>Output   | To/From                      | Signal Characteristics   | Row B                      | Input/<br>Output  | To/From                | Signal Characteristics  | Row C                           | Input/<br>Output  | To/From                | Signal Characteristics  |
| 1   | GPO_8 (WCO)                   | O  | J1-C32, J2-C32               | OCO, 100mA, 40V  | RX Lock (Aux I/O)          | O   | J1-B32, J2-B32         | OCO, 100mA, 40V; RX Lock, active high   | TX Lock (Aux I/O)               | O   | J1-A32, J2-A32         | OCO, 100mA, 40V; TX Lock, active high                               |
| 2   | PA Fail (Aux I/O)             | O  | J1-C31, J2-C31               | OCO, 100mA, 40V, active low  | GPO_13 (WCO)               | O   | J1-B31, J2-B31         | OCO, 100mA, 40V   | RdStat-R2 Control               | O   | J1-A31, J2-A31, J3-A26 | TTL output, high when unsequelched                                  |
| 3   | SCI_CLKK1                     | O  | J1-C30, J2-C30, J3-C28       | Do not use.  | RdStat or GPO_15, Note 4   | O   | J1-B30, J2-B30         | One side of relay closure, see C3   | RdStat or GPO_15, Note 4        | O   | J1-A30, J2-A30         | Other side of normally open relay, see B3                           |
| 4   | AC Fail                       | O  | P8-5, J1-C29, J2-C29, J3-C24 | TTL output, active high  | Carrier Detect Switch      | O   | J1-B29, J2-B29, J3-B24 | TTL output, active high   | Failsoft Output (Aux I/O)       | O   | J1-A29, J2-A29         | OCO, 100mA, 40V, active low   |
| 5   | GPI_3 (WCI)                   | I  | J1-C28, J2-C28               | Pulled up transistor input, 16V max  | GPI_8 (NS)                 | I   | J1-B28, J2-B28         | Pulled up transistor input, 16V max   | GPI_4 (WCI)                     | I   | J1-A28, J2-A28         | Pulled up transistor input, 16V max                                 |
| 6   | GP1_15 (–) (NS)               | I  | J1-C27, J2-C27               | –ve side opto-isolated input, see C7   | GPI_5 (NS)                 | I   | J1-B27, J2-B27         |   | Not Supported                   | I   | J1-A27, J2-A27, J3-B26 |   |
| 7   | Ext Failsoft (Aux I/O)        | I  | J1-C26, J2-C26               | Pulled up transistor input, 16V max  | Ext Repeat* (Aux I/O)      | I   | J1-B26, J2-B26         |   | GPI_15 (+) (NS)                 | I   | J1-A26, J2-A26         | +ve side opto-isolated input, see A6                                |
| 8   | GPI_1 (NS)                    | I  | J1-C25, J2-C25               |  | Trunk Duplex Enable*       | I   | J3-B25                 | TTL input   | Trunk TX Inhibit*               | I   | J3-A25                 | TTL input   |
| 9   | GPI_2 (NS)                    | I  | J1-C24, J2-C24               | Pulled up transistor input, 16V max  | GPI_13 (WCI) or GPO_7 (NS) | I/O   | J1-B24, J2-B24         | Caution: See Auxiliary I/O section for jumpering information  | RF Relay Control Out (Aux I/O)  | O   | J1-B5, J2-B5           | OCO, 200mA, 40V, active high  |
| 10  | VSWR_Fail* (Aux I/O)          | O  | J1-C23, J2-C23               | Pulled up transistor output (10Kohms to +5Vdc), active low   | Spare 311                  | –   | N/C                    |   | Ext PTT Out (Aux I/O) *, Note 5 | I   | J1-A23, J2-A23, J3-A23 | TTL input   |
| 11  | GPO_2 (WCO)                   | O  | J1-C22, J2-C22               | Pulled up transistor output (10kohms to +5Vdc)   | GPI_12 (WCI) or GPO_6 (NS) | I/O   | J1-B22, J2-B22         | Caution: See Auxiliary I/O section for jumpering information  | RSSI                            | O   | J1-A22, J2-A22, J3-A22 | RSS programmable sensitivity, Note 6                                |
| 12  | GPO_0 (WCO)                   | O  | J1-B25, J2-B25               |  | GPI_11 (WCI) or GPO_5 (NS) | I/O   | J1-B23, J2-B23         |   | GPI_10 (WCI) or GPO_4 (NS)      | I/O   | J1-A24, J2-A24         | Caution: See Auxiliary I/O section for jumpering information        |
| 13  | Antenna Relay                 | O  | P10-1, J3-C26                | OCO, 200mA, active low   | Spare 301                  | –   | N/C                    |   | Spare 304                       | –   | –                      |   |
| 14  | Not Supported                 | O  | J1-C18, J2-C18, J3-C19       |  | Not Supported              | I   | J1-B19, J2-B19, J3-B19 | TTL input   | Not Supported                   | O   | J1-A19, J2-A19, J3-A19 |   |
| 15  | Spare 310                     | –  | –                            |  | GND                        | –   | Station ground         |   | GND                             | –   | Station ground         |   |
| 16  | Spare 308                     | –  | –                            |  | Spare 300                  | –   | –                      |   | GND                             | –   | Station ground         |   |
| 17  | Aux TX Audio                  | I  | J1-C16, J2-C16, J3-C16       | RSS programmable input sensitivity   | Spare 321                  | –   | –                      |   | Disc RX Audio                   | O   | J1-A16, J2-A16, J3-A16 | Discriminator audio, flat response; 80mV to 400mV for 60% deviation |
| 18  | Cntrl 14.2 VDC                | O  | P8 pins 3, 4 (thru F2)       | +14.2Vdc, Note 1   | Cntrl 14.2 VDC             | O   | P8 pins 3, 4 (thru F2) | +14.2Vdc, Note 1  | Cntrl 14.2 VDC                  | O   | P8 pins 3, 4 (thru F2) | +14.2Vdc, Note 1  |
| 19  | GND                           | –  | Station ground               |  | GND                        | –   | Station ground         |   | GND                             | –   | Station ground         |   |
| 20  | 5 VDC                         | O  | P8 pins 7, 8                 | +5.1 ± 0.25 Vdc  | 5 VDC                      | O   | P8 pins 7, 8           | +5.1 ± 0.25 Vdc   | 5 VDC                           | O   | P8 pins 7, 8           | +5.1 ± 0.25 Vdc   |
| 21  | Not Supported                 | O  | J3-C12                       |  | RdStat or GPO_15, Note 4   | O   | J1-B12                 | OCO, 100mA, 40V   | Not Supported                   | O   | J3-A12                 |   |
| 22  | GP1_7 (WCI)                   | I  | J1-C11, J2-C11               | Pulled up transistor input, 16V max.   | Spare 322                  | –   | –                      |   | Spare 302                       | –   | –                      |   |
| 23  | Spare 323                     | –  | –                            |  | Spare 325                  | –   | –                      |   | Spare 324                       | –   | –                      |   |
| 24  | Spare 320                     | –  | –                            |  | Spare 309                  | –   | –                      |   | GPIO_0 (CNTR I/O)               | I/O   | J1-A9, J2-A9, J3-A17   | TTL input/output  |
| 25  | Spare 903                     | –  | –                            |  | Spare 902                  | –   | –                      |   | Spare 317                       | –   | –                      |   |
| 26  | Ext PTT or GP1_14 (–), Note 1 | I  | J1-C7, J2-C7                 | –ve side opto-isolated input, see A29  | Ext PTT or GPI_14, Note 2  | I   | J1-B7, J2-B7           | Pulled up transistor input, 16V max, see A29  | Spare 901                       | –   | –                      |   |
| 27  | GND                           | –  | Station ground               |  | GND                        | –   | Station ground         |   | GND                             | –   | Station ground         |   |
| 28  | GPI_9 (WCI) or GPO_3 (NS)     | I/O  | J1-C6, J2-C6                 | Caution: See Auxiliary I/O section for jumpering information   | Line 4+                    | O   | J4-C10                 | Wireline output, balanced (+)   | Line 3+                         | I   | J4-C12                 | Wireline input, balanced (+)  |
| 29  | Ext PTT or GPI_14 (–), Note 2 | I  | J1-C5, J2-C5                 | +ve. side opto-isolated input, see A26   | AC Fail or GPO_14, Note 3  | O   | J1-B4, J2-B4           | Other side of relay closure, see A30  | GPIO_1 (CNTR I/O)               | I/O   | J1-A4, J2-A4, J3-A13   | TTL input/output  |
| 30  | AC Fail or GPO_14, Note 3     | O  | J1-C4, J2-C4                 | One side of normally open relay, see B29   | Line 4–                    | O   | J4-A9                  | Wireline output, balanced (–)   | Line 3–                         | I   | J4-A11                 | Wireline input, balanced (+)  |
| 31  | GND                           | –  | Station ground               |  | GND                        | –   | Station ground         |   | GND                             | –   | Station ground         |   |
| 32  | Cntrl 14.2 VDC                | O  | P8 pins 3, 4 (thru F2)       | +14.2Vdc, Note 1   | Cntrl 14.2 VDC             | O   | P8 pins 3, 4 (thru F2) | +14.2Vdc, Note 1  | Cntrl 14.2 VDC                  | O   | P8 pins 3, 4 (thru F2) | +14.2Vdc, Note 1  |
| Note 1: For dc-only 250W power supplies, this voltage is equal to the input supply voltage. |                               | Note 2: This pin can be jumpered for Ext PTT (supported) or GPI_14 (not supported). See Aux I/O jumpers P2 and P9. |                              | Note 3: This pin can be jumpered for AC Fail (supported) or GPO_14 (not supported). See Aux I/O jumper P5. |                            | Note 4: This pin can be jumpered for RdStat (supported) or GPO_15 (supported). See Aux I/O jumpers P3 and P4. |                        | Note 5: Ext PTT signal output, taken from Ext PTT input. The output signal can be inverted, depending on jumper settings. See jumpers P2, P6, P9. |                                 | Note 6: For R03.01 (host software) and earlier, the fixed sensitivity is @ 172 mVrms for 60% system deviation. RSS programmable for pre-emphasized or flat response. DC offset +2.4V. High impedance input. |                        |   |

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| Table 2. J4 WIRELINE CONNECTOR |                    |                  |                              |                     |                  |                              |                     |                  |                           |
|--------------------------------|--------------------|------------------|------------------------------|---------------------|------------------|------------------------------|---------------------|------------------|---------------------------|
| Pin No.                        | Row A              | Input/<br>Output | To/From                      | Row B               | Input/<br>Output | To/From                      | Row C               | Input/<br>Output | To/From                   |
| 1                              | Wireline MCLK      | I                | J3-B6                        | Spare 5             | –                | –                            | Wireline BCLK       | I                | J3-C5                     |
| 2                              | GND                | –                | Station ground               | GND                 | –                | Station ground               | GND                 | –                | Station ground            |
| 3                              | 5 VDC              | I                | P8 pins 7, 8                 | 5 VDC               | I                | P8 pins 7, 8                 | 5 VDC               | I                | P8 pins 7, 8              |
| 4                              | GPIO_1 (CNTR I/O)  | I/O              | J1-A4, J2-A4, J5-C29, J3-A13 | Wireline 3/4 TXD    | O                | J3-B4                        | Wireline 3/4 RXD    | I                | J3-C4                     |
| 5                              | Wireline 1/2 TXD   | O                | J3-A5                        | Wireline 1/2 RXD    | I                | J3-B5                        | Spare 45            | –                | –                         |
| 6                              | Wireline 3/4 FSYNC | I                | J3-A6                        | Wireline2 Latch CS* | I                | J3-B7                        | Wireline 1/2 FSYNC  | I                | J3-C6                     |
| 7                              | MOSI               | I                | P7-8, J1-A7, J2-A7, J3-A7    | Spare 18            | –                | –                            | Wireline1 Latch CS* | I                | J3-C7                     |
| 8                              | GND                | –                | Station ground               | MISO                | O                | J1-B8, J2-B8, J3-B8, P7-9    | SPI CLK             | I                | P7-7, J1-C8, J2-C8, J3-C8 |
| 9                              | Line 4–            | O                | J5-B30                       | GND                 | –                | Station ground               | GND                 | –                | Station ground            |
| 10                             | Spare 28           | –                | –                            | Spare 37            | –                | –                            | Line 4+             | O                | J5-B28                    |
| 11                             | Line 3–            | I                | J5-C30                       | Spare 19            | –                | –                            | Spare 10            | –                | –                         |
| 12                             | Spare 1            | –                | –                            | Spare 38            | –                | –                            | Line 3+             | I                | J5-C28                    |
| 13                             | WL DC Control      | O                | J3-A27                       | WL DC Control REQ*  | O                | J3-B27                       | Spare 46            | –                | –                         |
| 14                             | GND                | –                | Station ground               | GND                 | –                | Station ground               | GND                 | –                | Station ground            |
| 15                             | 14.2 VDC           | I                | P8 pins 3, 4 (thru F1)       | 14.2 VDC            | I                | P8 pins 3, 4 (thru F1)       | 14.2 VDC            | I                | P8 pins 3, 4 (thru F1)    |
| 16                             | Spare 2            | –                | –                            | Reset*              | I                | J1-B16, J2-B16, J3-B16, P7-3 | Spare 47            | –                | –                         |
| 17                             | Spare 29           | –                | –                            | Spare 6             | –                | –                            | Spare 24            | –                | –                         |
| 18                             | Spare 15           | –                | –                            | Spare 20            | –                | –                            | Spare 25            | –                | –                         |
| 19                             | Spare 30           | –                | –                            | Spare 39            | –                | –                            | Wireline ID         | O                | J3-C22                    |
| 20                             | Spare 16           | –                | –                            | Coded WL RX Audio   | I                | J1-B20, J2-B20, J3-B20       | Raw WL TX Audio     | O                | J1-C20, J2-C20, J3-C20    |
| 21                             | Chassis GND        | –                | –                            | Chassis GND         | –                | –                            | Chassis GND         | –                | –                         |
| 22                             | Spare 31           | –                | –                            | Spare 40            | –                | –                            | Spare 27            | –                | –                         |
| 23                             | Spare 3            | –                | –                            | Spare 7             | –                | –                            | Spare 11            | –                | –                         |
| 24                             | Spare 32           | –                | –                            | Spare 41            | –                | –                            | Spare 48            | –                | –                         |
| 25                             | Spare 17           | –                | –                            | Spare 21            | –                | –                            | Spare 49            | –                | –                         |
| 26                             | Line 2+            | I/O              | J6-4                         | Line 2+             | I/O              | J6-4                         | Line 2+             | I/O              | J6-4                      |
| 27                             | Spare 4            | –                | –                            | Spare 8             | –                | –                            | Spare 12            | –                | –                         |
| 28                             | Line 2–            | I/O              | J6-3                         | Spare 22            | –                | –                            | Spare 50            | –                | –                         |
| 29                             | Spare 34           | –                | –                            | Spare 43            | –                | –                            | Spare 26            | –                | –                         |
| 30                             | Line 1+            | I                | J6- 2                        | Line 1+             | I                | J6-2                         | Line 1+             | I                | J6-2                      |
| 31                             | Spare 36           | –                | –                            | Spare 23            | –                | –                            | Spare 51            | –                | –                         |
| 32                             | Line 1–            | I                | J6-1                         | Spare 9             | –                | –                            | Spare 13            | –                | –                         |

STATION BACKPLANE MODULE

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| Table 3. J1 OPTION1 CONNECTOR |                          |                  |                              |                        |                  |                           |                       |                  |                             |
|-------------------------------|--------------------------|------------------|------------------------------|------------------------|------------------|---------------------------|-----------------------|------------------|-----------------------------|
| Pin No.                       | Row A                    | Input/<br>Output | To/From                      | Row B                  | Input/<br>Output | To/From                   | Row C                 | Input/<br>Output | To/From                     |
| 1                             | Spare                    | –                | –                            | Spare A12              | –                | J2-B1                     | Spare A1              | –                | –                           |
| 2                             | GND                      | –                | Station ground               | GND                    | –                | Station ground            | GND                   | –                | Station ground              |
| 3                             | 5 VDC                    | I                | P8 pins 7, 8                 | 5 VDC                  | I                | P8 pins 7, 8              | 5 VDC                 | I                | P8 pins 7, 8                |
| 4                             | GPIO_1 (CNTR I/O)        | I/O              | J2-A4, J3-A13, J4-A4, J5-C29 | GPO_14’ (WCO)          | O                | J2-B4, J5-B29             | GPO_14 (WCO)          | O                | J2-C4, J3-A30               |
| 5                             | Spare                    | –                | J2-A5                        | RF Relay Control Out   | O                | J2-B5, J5-C9              | GPI_14’ (WCI)         | I                | J2-C5, J5-A29               |
| 6                             | Spare                    | –                | J2-A6                        | RF Relay Control In    | I                | J2-B6, J3-A24             | GPI_9 or GPO_3 (WCIO) | I/O              | J2-C6, J5-A28               |
| 7                             | MOSI                     | I                | P7-8, J2-A7, J3-A7, J4-A7    | GPI_14 (WCI)           | I                | J2-B7, J5-B26             | GPI_14’’ (WCI)        | I                | J2-C7, J5-A26               |
| 8                             | GND                      | –                | Station ground               | MISO                   | O                | P7-9, J2-B8, J3-B8, J4-B8 | SPI CLK               | I                | P7-7, J2-C8, J3-C8, J4-C8   |
| 9                             | GPIO_0 (CNTR I/O)        | I/O              | J2-A9, J3-A17, J5-C24        | GND                    | –                | Station ground            | GND                   | –                | Station ground              |
| 10                            | OP1 CS2*                 | I                | J3-A10                       | OP1 CS4*               | I                | J3-B10                    | OP1 CS3*              | I                | J3-C10                      |
| 11                            | Secure Control2          | –                | N/C                          | OP1 CS1*               | I                | J3-B11                    | GPI_7 (WCI)           | I                | J2-C11, J5-A22              |
| 12                            | SCI RX Option1           | O                | J3-A9                        | GPO_15’’ (WCO)         | O                | J5-B21                    | Spare A11             | –                | J2-C12                      |
| 13                            | Spare                    | –                | –                            | Spare A18              | –                | J2-B13                    | SCI TX Option1        | I                | J3-B9                       |
| 14                            | GND                      | –                | Station ground               | GND                    | –                | Station ground            | GND                   | –                | Station ground              |
| 15                            | 14.2 VDC                 | I                | P8 pins 3, 4 (thru F1)       | 14.2 VDC               | I                | P8 pins 3, 4 (thru F1)    | 14.2 VDC              | I                | P8 pins 3, 4 (thru F1)      |
| 16                            | Disc RX Audio            | I                | J2-A16, J3-A16, J5-C17       | Reset*                 | I                | J2-B16, J3-B16, J4-B16    | Aux TX Audio          | I                | J2-C16, J3-C16, J5-A17      |
| 17                            | GND                      | –                | Station ground               | Decrypted RX Audio     | I                | J2-B17, J3-B17            | Clear TX Audio        | I                | J2-C17, J3-C17              |
| 18                            | GND                      | –                | Station ground               | GND                    | –                | Station ground            | TX Code Detect*       | I                | J2-C18, J3-C19, J5-A14      |
| 19                            | RX Code Detect* (Future) | I                | J2-A19, J3-A19, J5-C14       | Ext Code Detect        | I                | J2-B19, J3-B19, J5-B14    | Option1 ID            | O                | J3-C18                      |
| 20                            | Coded Mod Audio          | I                | J2-A20, J3-A20               | Coded WL RX Audio      | I                | J2-B20, J3-B20, J4-B20    | Raw WL TX Audio       | I                | J2-C20, J3-C20, J4-C20      |
| 21                            | GND                      | –                | Station ground               | Secure RX Audio        | I                | J2-B21, J3-B21            | GND                   | –                | Station ground              |
| 22                            | RSSI                     | I                | J2-A22, J3-A22, J5-C11       | GPI_12 or GPO_6 (WCIO) | I/O              | J2-B22, J5-B11            | GPO_2 (WCO)           | O                | J2-C22, J5-A11              |
| 23                            | Ext PTT*                 | I                | J2-A23, J3-A23, J5-C10       | GPI_11 or GPO_5 (WCIO) | I/O              | J2-B23, J5-B12            | VSWR FAIL* (WCO)      | O                | J2-C23, J5-A10              |
| 24                            | GPI_10 or GPO_4 (WCIO)   | I/O              | J2-A24, J5-C12               | GPI_13 or GPO_7 (WCIO) | I/O              | J2-B24, J5-B9             | GPI_2 (WCI)           | I                | J2-C24, J5-A9               |
| 25                            | Opt_IRQ*                 | O                | J2-A25, J3-C23               | GPO_0 (WCO)            | O                | J2-B25, J5-A12            | GPI_1 (WCI)           | I                | J2-C25, J5-A8               |
| 26                            | GPI_15 (WCI)             | I                | J2-A26, J5-C7                | Ext Repeat* (WCI)      | I                | J2-B26, J5-B7             | Ext Failsoft (WCI)    | I                | J2-C26, J5-A7               |
| 27                            | RX Inhibit-R2 Status     | I                | J2-A27, J3-B26, J5-C6        | GPI_5 (WCI)            | I                | J2-B27, J5-B6             | GPI_15’ (WCI)         | I                | J2-C27, J5-A6               |
| 28                            | GPI_4 (WCI)              | I                | J2-A28, J5-C5                | GPI_8 (WCI)            | I                | J2-B28, J5-B5             | GPI_3 (WCI)           | I                | J2-C28, J5-A5               |
| 29                            | Failsoft OUTPUT (WCO)    | O                | J2-A29, J5-C4                | Carrier Detect Switch  | I                | J2-B29, J3-B24, J5-B4     | AC Fail               | I                | P8-5, J2-C29, J3-C24, J5-A4 |
| 30                            | GPO_15 (WCO)             | O                | J2-A30, J5-C3                | GPO_15’ (WCO)          | O                | J2-B30, J5-B3             | SCI_CLCK1             | O                | J2-C30, J5-A3, J3-C28       |
| 31                            | Rdstat-R2 Control        | I                | J2-A31, J5-C2, J3-A26        | GPO_13 (WCO)           | O                | J2-B31, J5-B2             | PA Fail (WCO)         | O                | J2-C31, J5-A2               |
| 32                            | TX Lock (WCO)            | O                | J2-A32, J5-C1                | RX Lock (WCO)          | O                | J2-B32, J5-B1             | GPO_8 (WCO)           | O                | J2-C32, J5-A1               |

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| Table 4. J2 OPTION2 CONNECTOR |                          |                  |                              |                        |                  |                           |                        |                  |                             |
|-------------------------------|--------------------------|------------------|------------------------------|------------------------|------------------|---------------------------|------------------------|------------------|-----------------------------|
| Pin No.                       | Row A                    | Input/<br>Output | To/From                      | Row B                  | Input/<br>Output | To/From                   | Row C                  | Input/<br>Output | To/From                     |
| 1                             | Spare A14                | –                | –                            | Spare A12              | –                | J1-B1                     | Spare A15              | –                | –                           |
| 2                             | GND                      | –                | Station ground               | GND                    | –                | Station ground            | GND                    | –                | Station ground              |
| 3                             | 5 VDC                    | I                | P8 pins 7, 8                 | 5 VDC                  | I                | P8 pins 7, 8              | 5 VDC                  | I                | P8 pins 7, 8                |
| 4                             | GPIO_1 (CNTR I/O)        | I/O              | J1-A4, J3-A13, J4-A4, J5-C29 | GPO_14' (WCO)          | O                | J1-B4, J5-B29             | GPO_14 (WCO)           | O                | J1-C4, J3-A3                |
| 5                             | Spare A16                | –                | J1-A5                        | RF Relay Control Out   | O                | J1-B5, J5-C9              | GPI_14' (WCI)          | I                | J1-C5, J5-A29               |
| 6                             | Spare A19                | –                | J1-A6                        | RF Relay Control In    | I                | J1-B6, J3-A24             | GPI_19 or GPO_3 (WCIO) | I/O              | J1-C6, J5-A28               |
| 7                             | MOSI                     | I                | P7-8, J1-A7, J3-A7, J4-A7    | GPI_14 (WCI)           | I                | J1-B7, J5-B26             | GPI_14'' (WCI)         | I                | J1-C7, J5-A26               |
| 8                             | GND                      | –                | Station ground               | MISO                   | O                | P7-9, J1-B8, J3-B8, J4-B8 | SPI CLK                | I                | P7-7, J1-C8, J3-C8, J4-C8   |
| 9                             | GPIO_0 (CNTR I/O)        | I/O              | J1-A9, J3-A17, J5-C24        | GND                    | –                | Station ground            | GND                    | –                | Station ground              |
| 10                            | OP2 CS2*                 | I                | J3-A11                       | N/C                    | –                | –                         | OP2 CS3*               | I                | J3-C11                      |
| 11                            | Secure Control2          | –                | N/C                          | OP2 CS1*               | I                | J3-B12                    | GPI_7 (WCI)            | I                | J1-C11, J5-A22              |
| 12                            | SCI RX Option2           | O                | J3-C9                        | N/C                    | –                | –                         | Spare A11              | –                | J1-C12                      |
| 13                            | Spare A17                | –                | –                            | Spare A18              | –                | J1-B13                    | SCI TX Option2         | I                | J3-A8                       |
| 14                            | GND                      | –                | Station ground               | GND                    | –                | Station ground            | GND                    | –                | Station ground              |
| 15                            | 14.2 VDC                 | I                | P8 pins 3, 4 (thru F1)       | 14.2 VDC               | I                | P8 pins 3, 4 (thru F1)    | 14.2 VDC               | I                | P8 pins 3, 4 (thru F1)      |
| 16                            | Disc RX Audio            | I                | J1-A16, J3-A16, J5-C17       | Reset*                 | –                | J1-B16, J3-B16, J4-B16    | Aux TX Audio           | I                | J1-C16, J3-C16, J5-A17      |
| 17                            | GND                      | –                | Station ground               | Decrypted RX Audio     | I                | J1-B17, J3-B17            | Clear TX Audio         | I                | J1-C17, J3-C17              |
| 18                            | GND                      | –                | Station ground               | GND                    | –                | Station ground            | TX Code Detect*        | I                | J1-C18, J3-C18, J5-A14      |
| 19                            | RX Code Detect* (Future) | I                | J1-A19, J3-A19, J5-C14       | Ext Code Detect        | I                | J1-B19, J3-B19, J5-B14    | Option2 ID             | O                | J3-B18                      |
| 20                            | Coded Mod Audio          | I                | J1-A20, J3-A20               | Coded WL RX Audio      | I                | J1-B20, J3-B20, J4-B20    | Raw WL TX Audio        | I                | J1-C20, J3-C20, J4-C20      |
| 21                            | GND                      | –                | Station ground               | Secure RX Audio        | I                | J1-B21, J3-B21            | GND                    | –                | Station ground              |
| 22                            | RSSI                     | I                | J1-A22, J3-A22, J5-C11       | GPI_12 or GPO_6 (WCIO) | I/O              | J1-B22, J5-B11            | GPO_2 (WCO)            | O                | J1-C22, J5-A11              |
| 23                            | Ext PTT*                 | I                | J1-A23, J3-A23, J5-C10       | GPI_11 or GPO_5 (WCIO) | I/O              | J1-B23, J5-B12            | VSWR FAIL* (WCO)       | O                | J1-C23, J5-A10              |
| 24                            | GPI_10 or GPO_4 (WCIO)   | I/O              | J1-A24, J5-C12               | GPI_13 or GPO_7 (WCIO) | I/O              | J1-B24, J5-B9             | GPI_2 (WCI)            | I                | J1-C24, J5-A9               |
| 25                            | OPT_IRQ*                 | O                | J1-A25, J3-C23               | GPO_0 (WCO)            | O                | J1-B25, J5-A12            | GPI_1 (WCI)            | I                | J1-C25, J5-A8               |
| 26                            | GPI_15 (WCI)             | I                | J1-A26, J5-C7                | Ext Repeat* (WCI)      | I                | J1-B26, J5-B7             | Ext Failsoft (WCI)     | I                | J1-C26, J5-A7               |
| 27                            | RX Inhibit-R2 Status     | I                | J1-A27, J3-B26, J5-C6        | GPI_5 (WCI)            | I                | J1-B27, J5-B6             | GPI_15' (WCI)          | I                | J1-C27, J5-A6               |
| 28                            | GPI_4 (WCI)              | I                | J1-A28, J5-C5                | GPI_8 (WCI)            | I                | J1-B28, J5-B5             | GPI_3 (WCI)            | I                | J1-C28, J5-A5               |
| 29                            | Failsoft OUTPUT (WCO)    | O                | J1-A29, J5-C4                | Carrier Detect Switch  | I                | J1-B29, J3-B24, J5-B4     | AC Fail                | I                | P8-5, J1-C29, J3-C24, J5-A4 |
| 30                            | GPO_15 (WCO)             | O                | J1-A30, J5-C3                | GPO_15' WCO)           | O                | J1-B30, J5-B3             | SCI_CLKK1              | O                | J1-C30, J5-A3, J3-C28       |
| 31                            | Rdstat-R2 Control        | I                | J1-A31, J5-C2, J3-A26        | PL Detect Switch (WCO) | O                | J1-B31, J5-B2             | PA Fail (WCO)          | O                | J1-C31, J5-A2               |
| 32                            | TX Lock (WCO)            | O                | J1-A32, J5-C1                | RX Lock (WCO)          | O                | J1-B32, J5-B1             | GPO_8 (WCO)            | O                | J2-C32, J5-A1               |

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| Table 5. J3 CONTROLLER CONNECTOR |                         |                  |                           |                       |                  |                              |                       |                  |                             |
|----------------------------------|-------------------------|------------------|---------------------------|-----------------------|------------------|------------------------------|-----------------------|------------------|-----------------------------|
| Pin No.                          | Row A                   | Input/<br>Output | To/From                   | Row B                 | Input/<br>Output | To/From                      | Row C                 | Input/<br>Output | To/From                     |
| 1                                | 14.2 VDC                | I                | P8 pins 3, 4 (thru F1)    | 14.2 VDC              | I                | P8 pins 3, 4 (thru F1)       | 14.2 VDC              | I                | P8 pins 3, 4 (thru F1)      |
| 2                                | GND                     | –                | Station ground            | GND                   | –                | Station ground               | GND                   | –                | Station ground              |
| 3                                | 5 VDC                   | I                | P8 pins 7, 8              | 5 VDC                 | I                | P8 pins 7, 8                 | 5 VDC                 | I                | P8 pins 7, 8                |
| 4                                | 8 VDC                   | I                | U102-3                    | Wireline 3/4 TXD      | I                | J4-B4                        | Wireline 3/4 RXD      | O                | J4-C4                       |
| 5                                | Wireline 1/2 TXD        | I                | J4-A5                     | Wireline 1/2 RXD      | O                | J4-B5                        | Wireline BCLK         | O                | J4-C1                       |
| 6                                | Wireline 3/4 FSYNC      | O                | J4-A6                     | Wireline MCLK         | O                | J4-A1                        | Wireline 1/2 FSYNC    | O                | J4-C6                       |
| 7                                | MOSI                    | O                | P7-8, J1-A7, J2-A7, J4-A7 | Wireline2 Latch CS*   | O                | J4-B6                        | Wireline1 Latch CS*   | O                | J4-C7                       |
| 8                                | SCI TX Option2          | O                | J2-C13                    | MISO                  | I                | P7-9, J1-B8, J2-B8, J4-B8    | SPI CLK               | O                | P7-7, J1-C8, J2-C8, J4-C8   |
| 9                                | SCI RX Option1          | I                | J1-A12                    | SCI TX Option1        | O                | J1-C13                       | SCI RX Option2        | I                | J2-A12                      |
| 10                               | OP1 CS2*                | O                | J1-A10                    | OP1 CS4*              | O                | J1-B10                       | OP1 CS3*              | O                | J1-C10                      |
| 11                               | OP2 CS2*                | O                | J2-A10                    | OP1 CS1*              | O                | J1-B11                       | OP2 CS3*              | O                | J2-C10                      |
| 12                               | Ext SPI CS1*            | O                | J5-C21                    | OP2 CS1*              | O                | J2-B11                       | Ext SPI CS2*          | O                | J5-A21                      |
| 13                               | GPIO_1 (CNTR I/O)       | I/O              | J1-A4, J2-A4, J5-C29      | PA D/A CS*            | O                | P7-6                         | PA A/D CS*            | O                | P7-10                       |
| 14                               | 10 VDC EX               | I                | Regulator U101-3          | 10 VDC EX             | I                | Regulator U101-3             | GND                   | –                | Station ground              |
| 15                               | 10 VDC RX               | I                | Regulator U101-3          | 10 VDC RX             | I                | Regulator U101-3             | GND                   | –                | Station ground              |
| 16                               | Disc RX Audio           | O                | J1-A16, J2-A16, J5-C17    | Reset*                | O                | J1-B16, J2-B16, J4-B16, P7-3 | Aux TX Audio          | I                | J1-C16, J2-C16, J5-A17      |
| 17                               | GPIO_0 (CNTR I/O)       | I/O              | J1-A9, J2-A9, J5-C24      | Decrypted RX Audio    | I                | J1-B17, J2-B17               | Clear TX Audio        | O                | J1-C17, J2-C17              |
| 18                               | Ptemp+                  | I                | P10-3                     | Option2 ID            | I                | J2-C19                       | Option1 ID            | I                | J1-C19                      |
| 19                               | RX Code Detect*         | O                | J1-A19, J2-A19, J5-C14    | Ext Code Detect       | I                | J1-B19, J2-B19, J5-B14       | TX Code Detect*       | O                | J1-C18, J2-C18, J5-A14      |
| 20                               | Coded Mod Audio         | I                | J1-A20, J2-A20            | Coded WL RX Audio     | O                | J1-B20, J2-B20, J4-B20       | Raw WL TX Audio       | I                | J1-C20, J2-C20, J4-C20      |
| 21                               | GND                     | –                | Station ground            | Secure RX Audio       | I                | J1-B21, J2-B21               | GND                   | –                | Station ground              |
| 22                               | RSSI                    | O                | J1-A22, J2-A22, J5-C11    | GND                   | –                | Station ground               | Wireline ID           | I                | J4-C19                      |
| 23                               | Ext PTT*                | I                | J1-A23, J2-A23, J5-C10    | N/C                   | –                |                              | Opt IRQ*              | O                | J1-A25, J2-A25              |
| 24                               | RF Relay Control        | O                | J1-B6, J2-B6              | Carrier Detect Switch | O                | J1-B29, J2-B29, J5-B4        | AC Fail               | I                | P8-5, J1-C29, J2-C29, J5-A4 |
| 25                               | Trunk TX Inhibit*       | I                | J5-C8                     | Trunk Duplex Enable*  | I                | J5-B8                        | Serial ID             | I                | U100-2                      |
| 26                               | Rdstat-R2 Control       | O                | J1-A31, J2-A31, J5-C2     | RX Inhibit-R2 Status  | I                | J1-A27, J2-A27, J5-C6        | Antenna Relay         | O                | P10-1, J5-A13               |
| 27                               | WL DC Control           | I                | J4-A13                    | WL DC Control REQ*    | I                | J4-B13                       | PA Enable*            | O                | P7-2                        |
| 28                               | GND                     | –                | Station ground            | GND                   | –                | Station ground               | SCI_CLKK1             | O                | J1-C30, J5-A3, J2-C30       |
| 29                               | Trunk RX Audio          | O                | J7-22                     | Trunk TX Data+        | I                | J7-13                        | Trunk TX Data–        | I                | J7-21                       |
| 30                               | MRTI RX Audio           | O                | J7-7                      | MRTI TX Audio         | I                | J7-1                         | Aux Carrier* or TSTAT | O                | J7-12, J7-10                |
| 31                               | Trunk Mute*             | I                | J7-23                     | MRTI RX Carrier*      | O                | J7-15                        | PL Strip* or CCI      | I                | J7-24                       |
| 32                               | Patch Inhibit* or RSTAT | O                | J7-25                     | MRTI Monitor*         | I                | J7-4                         | Trunk MRTI PTT*       | I                | J7-2, J7-11                 |

**STATION BACKPLANE MODULE**  
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# Parts List

## TTN5062B Backplane Interconnect Module

| REFERENCE SYMBOL   | MOTOROLA PART NO. | DESCRIPTION                      |
|--|-------------------|----------------------------------|
| <b>CAPACITOR, FIXED: <math>\mu</math>F <math>\pm</math>10%; 100 V:</b> |                   |                                  |
| UNLESS OTHERWISE STATED  |                   |                                  |
| C100,101   | 2113743A19        | 0.1 $\mu$ F, $\pm$ 10%; 16V      |
| C102   | 2380090M24        | 10 $\mu$ F, $\pm$ 20%; 50 V      |
| C103,104   | 2311049A21        | 22 $\mu$ F, $\pm$ 10%; 20 V      |
| <b>FUSE:</b>   |                   |                                  |
| F1,2   | 6583049X05        | Fuse 5A Fast Acting With Holder  |
| <b>CONNECTOR, RECEPTACLE:</b>  |                   |                                  |
| J1 thru 5  | 0982513W01        | Receptacle 96 PIN PF EURO STD    |
| J6   | 3183021X02        | Terminal Block 4P Wiretrap 22AWG |
| J7   | 0982528W01        | RECEPT DB 25 PF                  |
| <b>CONNECTOR, PLUG:</b>  |                   |                                  |
| P7   | 2885155U01        | plug, 10-contact                 |
| P8   | 2884490T04        | HDR 2X4 VERT PWR                 |
| P10  | 2813922A03        | HDR 3 POS STR .1 CTR GLD PLTD    |
| <b>INTEGRATED CIRCUIT: (SEE NOTE)</b>                                  |                   |                                  |
| U100   | 5191036A01        | IC Silicon SN SM DS2400          |
| U101   | 5182276R82        | Regulator, LO Voltage Dropout    |
| U102   | 5113816D03        | IC 8V Positive Regulator,1.0A    |
| <b>NON-REFERENCED ITEMS</b>  |                   |                                  |
|  | 5482006W01        | Label, PCB barcode               |
|  | 5482006W02        | ribbon, thermal transfer         |
|  | 5484960T02        | Label Blank Barcode              |

**Note:** For optimum performance, integrated circuits must be ordered by Motorola part number.

The differences between TTN5062A and TTN5062B are:

1. The system connector was rotated 180 degrees.
2. Some of the pin assignments were changed.
3. Wireline connector changed from 3183021X01 to 3183021X02.

## TTN5062B Backplane Interconnect Module

| REFERENCE SYMBOL | MOTOROLA PART NO. | DESCRIPTION |
|------------------|-------------------|-------------|
|------------------|-------------------|-------------|